RAPID ASSESSMENT OF COMMUNITY NUTRITION PROBLEMS

A CASE STUDY OF PARBHANI, INDIA

Purnima Kashyap
and
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Abstract / Résumé / Resumen

Abstract — An exploratory study in Parbhani, a rural community of the western dryland region of India, assessed community nutrition problems and formulated recommendations for nutritional improvement. The qualitative and iterative methodology of rapid rural appraisal (RRA) allowed an assessment of the broad causes of malnutrition. The study emphasized the importance of personal interviews and group discussions over questionnaires in discovering the opinions of village people on particular issues. Through open-ended surveys and discussions, in-depth information was obtained on agricultural patterns, food habits, food-storage and marketing practices, infant-feeding practices, and cultural beliefs and taboos. Secondary data on health facilities, food-distribution systems, and nutrient-supplementation programs were taken from government sources. The final section includes four major recommendations for nutritional improvement in the Parbhani community: anthropological methodologies should be used to analyze the food and nutrition situation and to determine root causes of malnutrition at the community level; storage techniques and marketing strategies must be improved and the food policy reframed in light of specific regional needs; the effect of modernization in agriculture must be reanalyzed to assess its impact on women labourers; and, so that nutritional status be improved through active participation, grass-roots organizations must be encouraged to motivate people and to organize women's groups.

Résumé — Une étude exploratoire menée à Parbhani, une collectivité rurale située dans les terres arides de l'ouest de l'Inde, a permis d'évaluer les problèmes de nutrition des habitants et de formuler des recommandations pour y remédier. À l'aide de la méthode qualitative et interactive de l'évaluation rurale rapide (ÉRR), on a évalué les causes générales de la malnutrition. L'étude a fait ressortir à quel point il est important d'effectuer des interviews individuelles et des discussions en groupe à partir de questionnaires pour connaître l'opinion des villageois sur certaines questions. Par le biais de discussions et d'enquêtes ouvertes, on a recueilli des données exhaustives sur les modèles agricoles, les habitudes alimentaires, l'entreposage des aliments et les modes de commercialisation, les pratiques touchant l'alimentation des nourrissons et les croyances et tabous d'ordre culturel. Des données secondaires sur les installations de santé, les systèmes de distribution des aliments et les programmes d'apport complémentaire d'éléments nutritifs ont été obtenues de sources gouvernementales. La dernière section comporte quatre recommandations importantes pour l'amélioration de la nutrition à Parbhani : on préconise d'utiliser des méthodes anthropologiques pour analyser la situation en matière d'alimentation et de nutrition et déterminer les causes fondamentales de la malnutrition au niveau communautaire; d'améliorer les techniques d'entreposage et les stratégies de commercialisation et de reformuler la politique en matière d'alimentation à la lumière des besoins des régions; d'analyser de nouveau les effets de la modernisation de l'agriculture pour en évaluer les répercussions sur les ouvrières agricoles; et, afin de susciter une amélioration de l'état nutritionnel grâce à une participation active, d'encourager les organismes de la base à motiver les villageois et à organiser des groupes de femmes.

Resumen — En Parbhani, comunidad rural de tierra firme en la región occidental de la India, se realizó un estudio exploratorio que evaluó problemas nutricionales de la comunidad e hizo recomendaciones para mejorar la nutrición de sus miembros. La metodología cuantitativa e interactiva de análisis rural rápido (ARR) permitió evaluar ampliamente las causas de la desnutrición. El estudio enfatizó la importancia que tienen las entrevistas personales y las discusiones de grupo con ayuda de cuestionarios para descubrir las opiniones de los habitantes de los pueblos sobre determinadas cuestiones. A través de encuestas abiertas, es decir, sin límite fijo de vigencia, se obtuvo información importante sobre patrones agrícolas, hábitos alimentarios, almacenamiento de alimentos y prácticas de mercadeo, hábitos de alimentación de lactantes y creencias y tabúes culturales. Los datos secundarios acerca de instalaciones de salud, sistemas de distribución de alimentos y programas para la provisión de nutrientes suplementarios se extrajeron de fuentes del gobierno. La sección final incluye cuatro recomendaciones principales para mejorar la nutrición en la

comunidad de Parbhani: se deben utilizar metodologías antropológicas para analizar la situación de los alimentos y la nutrición y determinar las causas que originan la desnutrición de los miembros de la comunidad; se deben mejorar las técnicas de almacenamiento y las estrategias de mercadeo y reorientar la política que se sigue en relación con los alimentos de acuerdo con necesidades regionales específicas; se debe analizar nuevamente el efecto que causa la modernización en la agricultura para evaluar su repercusión en las mujeres trabajadoras; y, con el fin de que mejore la situación nutricional a través de la participación activa, se debe estimular la creación de organizaciones de base para motivar a los miembros de la comunidad y organizar grupos de mujeres.

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Foreword

Past attempts to understand and address community nutrition problems have met with limited success. Generally, the complex, interrelated factors causing malnutrition have not been adequately appreciated and the possibility of involving community members in identifying, analyzing, and resolving their nutritional problems has been largely ignored. Although a deeper understanding of the causal factors of malnutrition and their interactions is now evolving, much practical and analytical work still remains.

This timely publication explores how the rapid appraisal technique was applied in a dryland community in India to identify key causes of nutritional problems and can be used to guide for formulation of policy for nutritional improvement. The authors provide in-depth knowledge of local customs and beliefs, food availability and market forces, health problems and services, socioeconomic environments, and infant-feeding practices through a broad analysis of qualitative, and some quantitative, data. They challenge exclusive reliance on conventional quantitative methods in nutritional surveys and argue for a social anthropological approach, including group discussions. They demonstrate that a great deal can be learned using such methods — throughout the study on which this publication is based, community participation was emphasized. Good survey methodology, interactive skills, and systematic analysis of the obstacles to adequate nutrition are essential elements for valid work of this kind.

The study sets an excellent example through deliberately seeking out remote communities and the most disadvantaged people within them. The book shows that a rapid rural appraisal approach does not necessarily require a multidisciplinary team in the field — an important point in terms of saving costs and facilitating logistics.

The authors are to be commended not only for their research design but also on their analysis of collected materials and their down-to-earth recommendations. The publication will help to fill the gaps that exist in the knowledge of conditions in remote villages with rainfed agriculture and demonstrate the usefulness of rapid appraisal techniques for identifying problems in community nutrition. This case study indicates what can be achieved in addressing the complexities of malnutrition and providing some solutions.

The book should prove a valuable aid in training. It provides a basis for new nutritional research practices that could lead to a considerable advance in investigations of rural nutrition and health in the developing world. It will also be of considerable value to policymakers and to all those concerned with ameliorating malnutrition.

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Our greatest appreciation, however, goes to the village people who, contrary to most notions, are aware of the causes of malnutrition and other health-related problems, and associate these causes with a lack of resources and with exploitation. Without the cooperation of the families visited and of those who involved themselves in discussions, a clear understanding of their needs could not have been attained.

We also appreciate the efforts of Ms Neeta Sagar, who painstakingly typed several drafts of this report.

Purnima Kashyap
Richard H. Young

1 Introduction

In current agendas addressing the unresolved malnutrition problems of South Asian countries, two factors are now recognized as critical to a design for viable interventions: a better understanding of the causes of malnutrition in rural communities; and the orientation and participation of the members of those communities. In reviewing the linkages between agricultural development and nutrition, Pacey and Payne (1985) comment that "learning from farmers could be the biggest improvement in research that is feasible within the present political economy." This community focus is now considered fundamental to the success of nutrition-improvement initiatives: by involving local communities in identifying and analyzing the causes of their malnutrition problems, we enable the members to identify those obstacles with which they can themselves deal and those requiring the involvement of authorities or specific sectors. The development of such approaches to problem identification and action planning in community nutrition demands an interactive mode of research, in which scientists and community members learn from each other.

Although these needs have been acknowledged, there is little experience in the application of interactive methodologies at the community level for nutrition-program design. Indeed, with regard to the elaboration of projects and programs to assist the rural poor and malnourished, there is, as Longhurst (1987) has pointed out, a dissatisfaction among nutrition planners with the methods employed to collect information and data. Nutrition planning has, in the past, made excessive demands on facilities for data collection, analysis, and use (Field 1987). It is often found that information, gathered through nutrition surveys as a basis for program planning, becomes obsolete or unreliable by the time the data is analyzed and the report prepared (Belshaw 1981; Longhurst 1987). Above all, those involved in nutrition policy-making have tended to become distant from the malnourished and, perhaps, insensitive to their needs. Ways must be found of reallocating the time spent by nutrition researchers and policymakers in excessive data collection and analysis: this time would be better spent in liaison with those people intended to benefit from the programs. Emphasis has, in the past, been on detailed measurement of the *effects* of malnutrition; there is, however, an urgent need to evolve reliable methodologies to evaluate the major *causes* of malnutrition. The rapid provision of reliable information from the rural communities would create a sound basis for the design and implementation of effective interventions. In developing appropriate methodologies for such problem-identification exercises, we must give greater consideration to the techniques of applied anthropology, and to the use of qualitative data.

The Rapid Rural Appraisal (RRA) technique is one approach that may hold promise for application in the design of community-nutrition programs. RRA has hitherto been effectively applied in farming systems research (KKU 1987) and in agricultural marketing and food-systems analysis (Holtzman 1986). RRA has been defined as any systematic activity designed to draw inferences, conclusions, hypotheses, or assessments, including acquisition of new information, in a limited period of

time (Grandstaff and Grandstaff 1987). In the nutrition context, the RRA technique enables researchers to obtain:

- Extensive information on a broad range of community activities;
- A better understanding of systems dynamics; and
- An appreciation of the interlinked factors influencing the nutritional status of community members.

RRA may also facilitate interaction between researchers of different disciplines, and interaction between researchers and the community, the latter encouraging community participation in identifying and solving nutrition problems.

It is generally acknowledged that centrally planned food and nutrition programs have too often failed to deliver services to the most malnourished. As Gopalan (1987) states, "The challenge is how to reach the unreached." In meeting this challenge, more attention needs to be paid to the dynamics of malnutrition — where and how it is a problem, and what the long- and short-term answers to it are from the perspective of the malnourished themselves. Clearly, the design of nutrition programs first requires developing and testing fresh methodologies for data-gathering. Here, RRA may have an important role to play in community-nutrition research.

This report has arisen from a rural appraisal conducted in the Parbhani district of Maharashtra, India. The region is part of the western dryland belt extending over Karnataka, Maharashtra, Andhra Pradesh, and parts of Gujarat, Rajasthan, and Madhya Pradesh. The objectives of this activity were:

- To examine interrelating factors that influence the nutritional status of the rural inhabitants of this region;
- To determine key interventions that may improve nutrition in the targeted communities, both in the short and long terms;
- To identify further research needs; and
- To evaluate the RRA technique as a basis for community assessment, nutrition planning, and program design.

Observations were made and discussions conducted on agricultural patterns, postharvest systems, food habits and practices (with special reference to women and children), marketing strategies, sociocultural environment, land use and labour patterns, and overall nutrition and health status of the population. It is hoped that this document, resulting from the above explorations, will contribute to methodology design in formulating nutrition programs and policies.

2 Methodology

Characteristics of the region

Maharashtra is the third largest state in India, in terms both of area and of total population (Muthiah 1987). Located in the southwestern part of India, it covers an area of 307 690 km^2 and has a total population of 62.78 million. Two-thirds (40.79 million) of the population of Maharashtra live in the villages.

The state is divided, on historic, political, and agroclimatic grounds, into four regions; these regions are Konkan, Vidharbha, Marathwada, and Western Maharashtra. The southeastern part of Maharashtra forms the Marathwada region, and Parbhani is one of seven districts in this region. The average rainfall in Parbhani district ranges from 68 to 76 cm annually, making it the zone of "assured" rainfall. Each district is further subdivided into *talukas* for more efficient administration; Parbhani has seven *talukas* — Hingoli, Pathri, Gangakher, Basmath, Kalamnuri, Jintur, and Partur.

Collaborating institution

Informal collaboration with the Marathwada Agricultural University (MAU) in Parbhani was established to facilitate the fieldwork. MAU has a College of Home Science, with a Department of Foods and Nutrition, a staff strength of seven, and an average of nine master's level students per year. The master's students take up either laboratory or field (community) studies as part of their dissertation work. A comprehensive course in community nutrition enables all students to spend time in the rural community and thus gain a better understanding of the people. Two graduates of the master's program were, therefore, selected to assist with the rural appraisal; they served as translators during our visits and at other times conducted the survey independently.

Survey design

Before beginning the field work, we constructed a format that would interrelate those factors affecting the nutritional and health status of rural communities (Fig. 1). To guide the survey and village discussions, a questionnaire was designed (Appendix I). The format and questionnaire were formulated with inputs from specialists in various disciplines, including nutrition, sociology, and agricultural sciences. Although the questionnaire was not strictly followed, it assisted in creating presurvey dialogue and in imprinting a research protocol in the minds of the surveyors.

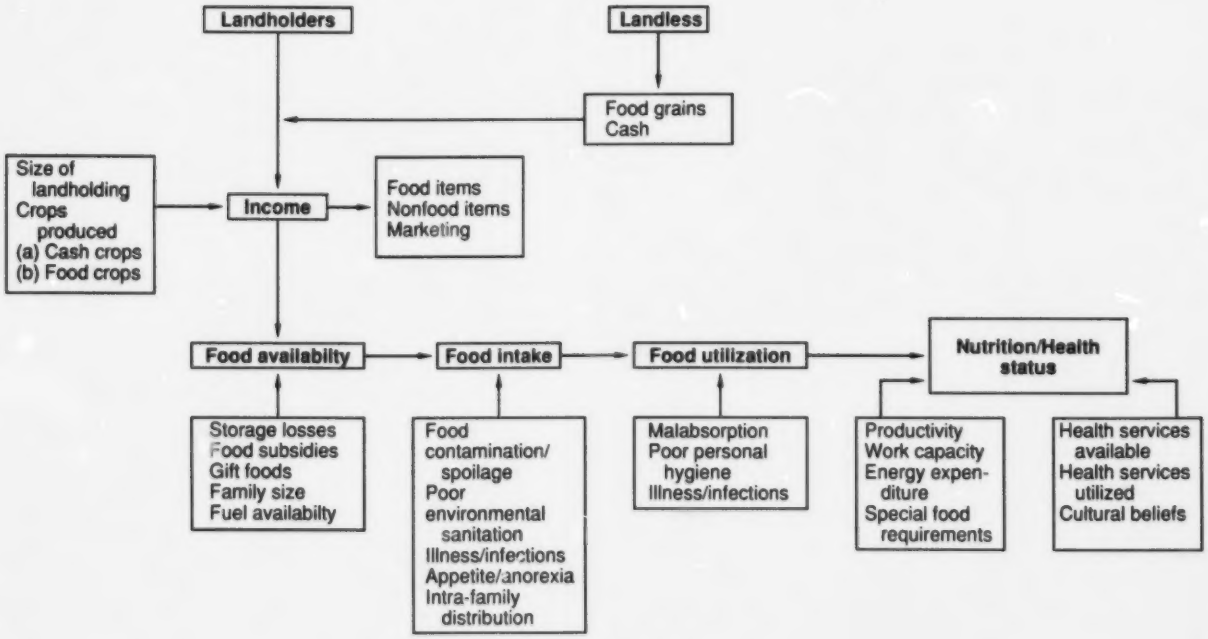


Fig. 1. Factors affecting the nutritional and health status of the rural community.

Mode of data collection

The field assistants were already experienced in the chosen communities and interacted freely, holding discussions with the local people. Respondents were encouraged to express their own feelings on and perceptions of particular issues. The field assistants recorded these observations in the form of qualitative field notes, and collated the relevant quantitative data (see Appendix I). To conduct an interview without hampering the person interviewed in his or her work, the assistant often tramped through muddy pathways and sticky fields.

Duration of the study

The total study period was 9 months, divided into three phases: planning, implementation, and information analysis and report-writing.

The planning phase included identifying RRA needs, in the nutrition context, for the study region. During this phase, which lasted 2½ months, educational institutions were approached with a view to possible collaboration. In the implementation phase, secondary data were collected on those villages identified in Phase 1, a questionnaire was formulated, and the rural appraisal was carried out. This phase lasted nearly 4 months, of which 6 weeks were taken up by intensive field work. In the third and final phase, information analysis and report-writing, the information gathered through RRA was compiled, and priority areas for intervention identified; this phase lasted about 2½ months.

Although the duration of the study was insufficient to cover all seasons and agroclimatic conditions, we attempted to obtain as much information as possible through general discussions with the respondents. The discussions dealt both with periods that are labour-intensive and with those in which there is little agricultural activity.

Selection of villages

Ideally, villages selected for rural appraisal should be far from urban influence and, to rule out "tarmac bias," away from main road connections (Chambers 1981). In this study, every effort was made to reach the poorest villages, and extra efforts were made to get off the well-made pathways and into the remote corners of the villages, to interact with the landless labourers, with the *harijans* (the scheduled caste), and with the other poor sections of the communities.

Data collection

The villages selected covered three of the seven *talukas* in Parbhani district. The village farthest from the district headquarters was Kerwari, 54 km away; the rest were between 20 and 35 km from Parbhani.

Approaching the village

The team visited the villages not as rural surveyors but as people from any village would visit another, by public transport, i.e., buses. The public transport system in the

rural areas is uncertain: often buses do not arrive for hours at a stretch. Valuable field time was therefore lost. The rains make the muddy roads slushy and untreadable, and several attempts had to be made to gain access to certain villages.

Visits to nearly 200 families were made, with an average of 25–30 families per village. Quantitative data were obtained from a total of 110 families during the 6 weeks' intensive field period, with emphasis on the small and marginal farmers and on the landless.

In-depth information was obtained on agricultural patterns, food habits, storage and marketing practices, and cultural beliefs and taboos (Fig. 1). Although the heads of the households were mostly men, both men and women participated in the relevant discussions. Group discussions were also encouraged: for example, groups of five or six women were often interviewed together; this technique was particularly useful in eliciting information on cultural beliefs and taboos, and on the reasoning behind certain feeding practices.

Given the emphasis on dialogue and on open-ended survey, it was not possible to visit more households: often only two families could be visited in 1 day.

Secondary data collection

Documented information on the region was gathered from various sources. An intensive literature search was conducted at the Marathwada Agricultural University. This was followed by discussions with experts in the fields of agriculture, rural extension, and nutrition. Discussions were also held with the District Health Officer (DHO) and his staff. With the assistance of the DHO, field visits were made to several of the villages' Primary Health Centres, and recorded information gathered on the health issues of each community. Health officers, nursing staff, and field workers provided insights into problems faced by the health personnel in implementing programs, and those faced by the beneficiaries in using the extended services. Information was also obtained from records available at the District Health Office on various health problems of the region, and from the District Collector's office on the food-rationing system and on fair-price shops.

3 Results

Village scenario in brief

The villages visited typically have mud houses with thatched or tiled roofs; a few houses, belonging to the rich landlords and village moneylenders, are made of bricks and cement. The houses are haphazardly arranged and have very poor ventilation, with only a door and perhaps a window on the front. The lanes and by-lanes in all the villages are of mud; tar- or even stone-filled roads are few. After a single shower, it becomes impossible to walk through the village without getting one's feet soaked in wet, sticky mud.

The people continue to do much of their traveling on foot. Although the most common mode of transport within the village and to the fields is still the bullock cart, there is public transport, in the form of buses, between villages.

The village economy is essentially agrarian; although traditional patterns of cultivation are dominant, some modern adaptations are seen, especially in the use of hybrid seed varieties. Every household depends on agriculture, either directly, as with the landowners, or indirectly, as with the labourers. Most of the village population are small landholders or landless.

From the data obtained, 88% of the landholders and only 9% of the landless own some livestock. Cows, buffalo, and bullocks are commonly owned by landholders. Some farmers also own goats (24%), poultry (12%), and sheep (4%). The landless inhabitants own mainly goats and poultry. Although the economy is basically traditional, the pattern is fast changing to a money economy in which labourers receive their wages both in cash and in kind. The current increase in the production of cash crops also indicates a shift to the money economy. Although the barter system is occasionally used, most items are purchased with cash. Because villagers depend on the local moneylenders for credit, banking facilities are conspicuous by their absence.

In an agrarian economy, it is difficult to estimate actual income and food expenditure. Landowners, producing their own staple grain and pulses, do not consider the cost of food in the family budget. Labourers often obtain grain as wages and, therefore, include only part of the cost of their food in such a budget. This is not the case with labourers obtaining only cash wages, however, for whom the bulk of the family budget is food-related; seasonal fluctuations in market prices, therefore, affect this latter category most. Table 1 gives the background information obtained from the surveyed families.

The villages lack sanitation. Open drainage, with dirty water often overflowing due to clogging, runs along the outside walls of the houses and flows into the pathways. There were no latrines in any of the villages visited. Men, women, and children ease themselves in the open fields. Even the richest farmer has no latrine facilities.

Table 1. Background information on the surveyed families.

	Family category	
	Landholder	Landless
Family size	5–7	5–6
Type of family		
Nuclear	55 (80.9)[a]	37 (88.1)
Extended	13 (19.1)	5 (11.9)
Education		
Illiterate	24 (35.3)	17 (40.5)
Primary	29 (42.6)	25 (59.5)
Secondary	15 (22.1)	0
Occupation		
Farming	37 (54.4)	5 (11.9)
Labour	22 (32.4)	37 (88.1)
Both	9 (13.2)	0
Economic status		
High (>10 ha of land)	5 (7.4)	0
Middle (4–10 ha of land)	12 (17.6)	0
Low (<4 ha of land)	51 (75.0)	42 (100.0)
Religion		
Hindu	66 (97.1)	36 (85.7)
Muslim and others	2 (2.9)	6 (14.3)
Total number of families	68	42

[a] Values in parentheses are percentages and may not add to 100 due to rounding.

Inefficient health programs and a total absence of any nutrition and supplementary feeding program, especially for women and children, were observed. The exception was the village Pimpalgaon where *sukhadi* (a corn–soy milk powder) had once been distributed; this distribution has, however, been discontinued. Milk is provided in only some of the primary schools.

Nuclear families are most common; only about 15% of families are extended (Table 1). The families range from 5 to 7 members, with only a minor difference between the landholders and the landless. The villagers are mostly Hindu (93%), dominated by Marathas, and the rest (7%) are Muslims, Buddhists, and people of other religions.

Discrimination between the castes still exists. The houses of the *harijans* (lowest caste) are found in one corner of the village and always have a separate source of water.

Not all villages have schools. In education, a clear distinction was observed between the landholders and the landless. Although secondary education is rare among the latter, it is received by nearly a quarter of the landholders. This suggests that the children of labourers take up wage-earning activities in lieu of further education. Discussions with the villagers, together with observations in the field, confirmed this observation.

Landholdings

The families visited were mainly the landless and marginal (defined as owning less than 2 ha) or small (owning 2–4 ha) landholders. About 84% of the village population (landless included) own less than 4 ha of land per family (Table 2).

Table 2. Size of landholdings of families surveyed.

Land owned (ha)	Total number of families	Percentage of families
0	42	38.2
0–2	32	29.1
2–4	19	17.3
4–6	10	9.1
6–10	2	1.8
10–14	3	2.7
>14	2	1.8

Discussions with village elders revealed that the villages are indeed dominated by small landholders or landless labourers; the elders estimated that fewer than 5% of families own 10 ha or more of land. This corroborated our data. Zaidi (1982) has reported that, in India, the proportion of operational holdings of less than 1 ha is 50% (Fig. 2).

The land division that has followed each generation has been caused both by the continuous increase in population and by the shift to a nuclear family system. Family land is divided equally among the sons, and little new land is coming into cultivation. A father who is a small landholder can offer no more than 0.5–1 ha to his sons; they will then further divide it among their sons. Bhalerao, who now owns less than 1 ha of land, has three sons among whom this land will eventually be distributed.

The agriculturist

Bhogaji is a small landholder, owning 1.6 ha of land. A *nai* (barber) by caste, he occasionally earns small amounts of money through this traditional occupation. For the day on which we visited him, his income from this profession was only 40 paise —

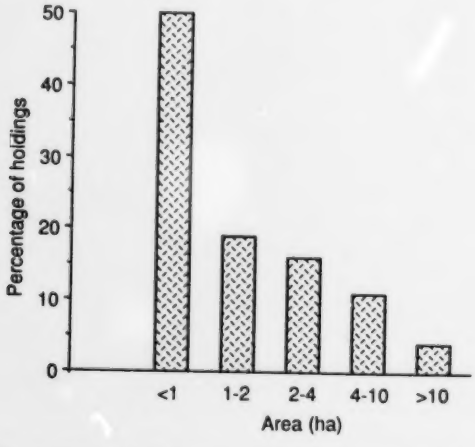


Fig. 2. Proportions of various sizes of operational holdings.

Men's work is generally physically demanding.

Older children often take care of their siblings while the mothers work in the fields.

the price of a single haircut (100 paise = 1 Indian rupee). He is occasionally paid in kind. Most small farmers earn money to buy food and other necessities by hiring themselves out as casual labour on larger landholdings (indicated in Table 1, where over 30% of the landholders carried out additional labour) or by working in construction. During the lean summer months, they will sometimes take up menial jobs in the cities. Contractors often come to the villages during these lean periods and take villagers (mostly landless) to construction sites in the urban areas. A group of 20–30 labourers make this trip together, accompanied by the contractor himself, who often pays part of their wages in advance — a great incentive, as it helps them to clear some of their debts. Although the wages in the cities are higher than those paid in the villages, any money saved is used to clear the balance of these debts.

Trimwakrao Dhage owns 3.2 ha of land. Like many other small farmers, he owns no agricultural implements. All implements, including the pair of bullocks and plow, are borrowed from other farmers. He pays rental fees of INR 30/day for the bullock pair, but manages to get the other implements free (13.40 Indian rupees [INR] = 1 United States dollar [USD]). This dependence on others for implements often delays his own farming operations; sometimes his work must be hurried so that the implements can be returned quickly.

Small farmers often obtain assistance from their family members. The harder jobs in the fields, such as plowing, sowing, spraying, and lifting of heavy material, are performed by men; the lighter jobs, such as weeding, picking, and harvesting, are done by women.

Many small and marginal farmers prefer to rent out their land, or to create an informal partnership with another farmer who owns implements and who handles all the farming operations. The two farmers divide the crop yield equally, as well as every expense incurred on the land including labour charges. Such an association permits the small farmer to earn wages elsewhere as a labourer, thus bringing in cash for other food or nonfood items.

Dilemma of cash versus food crops

Until some years ago, the farmer's priority was to produce food crops, keeping aside grains for the family needs and only then selling the surplus. The agricultural system is, however, changing as cash-crop farming becomes increasingly popular. Large farmers can grow cash crops as well as the food crops needed by their families. Marginal or small farmers encounter problems. Although small farmers may manage both food and cash crops, they must give priority to the food crops. For marginal farmers, it is an extremely difficult decision to make: although they would prefer to grow food crops, they reason that they can manage to obtain food grains as or from labour wages; thus, they become tempted to grow cash crops. Sometimes this decision pays.

Mohanrao owns 0.75 ha of land. Because of the previous year's failure of the sorghum crop, he decided this year to grow cotton on his land. This paid dividends. Insufficient and inconsistent rainfall led again to a poor sorghum crop this year, leaving some marginal farmers with no yield at all. Mohanrao managed, however, to sell his cotton yield, fetching some cash to add food grains to the supply that he and his wife had collected as wages. When asked what had prompted him to take this decision, Mohanrao said, "A lot of large farmers are shifting to cash crops and earn a lot of money, so I decided to try it out myself." The significance of cash cropping in relation to nutrition and food security, however, will need to be further explored.

Crops and cropping seasons

The cropping seasons *kharif* and *rabi* are closely related to the summer and winter monsoon seasons. The abnormal weather conditions in these seasons, particularly with respect to rainfall, significantly affect the agricultural operations of the area.

Three seasons of the year are generally recognized:

- The cold-weather season (November to February);
- The hot-weather season (March to mid-June); and
- The season of rains (mid-June to October).

The comparatively dry part of the year, November to mid-June, is divided into the cold- and hot-weather season. The former corresponds to the season of *rabi* crops; the latter is completely dry and does not allow for cultivation. The wet summer, mid-June to October, corresponds to the *kharif* season. The winter rains are important for *rabi* crops. The failure or inadequacy of winter rainfall would not, however, harm the *rabi* crop as much as insufficient, or delayed, summer monsoon rainfall would the *kharif* crops. The crops cultivated during the *kharif* and *rabi* seasons are indicated in Table 3.

The staple grain of the region is sorghum (*Sorghum bicolor*). The high yield variety (HYV) commonly produced is CSH-9. 'Maldandi' (M-35-1), a cream-coloured grain producing a light-hued flour, is preferred by farmers for its appearance and taste. The large landholders often grow 'Maldandi' for their own consumption and the HYV for sale. (Although considered by the growers to be inferior, the HYV nevertheless gives high yields and, therefore, a larger net income.) The major pulse crop is red gram (*Cajanus cajan*, 57%), followed by green gram (*Phaseolous aureus*, 39%) and black gram (*Phaseolous mungo*, 22%). Oilseeds — sunflower, safflower, and sesame — are produced for sale as well as for consumption. A few farmers also cultivate seasonal vegetables.

Lack of irrigation facilities prevents most farmers from taking any crops during the summer season. The failure or inconsistency of rainfall in the last 3–4 years has resulted in heavy losses for most farmers, only 5% of whom own irrigated land. Some of the large landholders in Kerwari, Kathneshwar, and Pimpalgaon villages have land irrigated either by canals or by tube wells and, therefore, can cultivate wheat and paddy crops, in addition to sorghum.

Table 3. Percentages of crops cultivated in kharif *and* rabi *seasons.*

Crop	*Kharif*	*Rabi*
Sorghum	94.0 (63)[a]	79.1 (53)
Red gram	56.7 (38)	—
Green gram	38.8 (26)	—
Black gram	22.4 (15)	—
Pearl millet	19.4 (13)	—
Sunflower	7.5 (5)	—
Bengal gram	5.9 (4)	22.4 (15)
Paddy	4.5 (3)	—
Sesame	1.5 (1)	—
Wheat	—	26.9 (18)
Safflower	—	32.8 (22)
Cotton	—	17.9 (12)
Sugar cane	—	5.9 (4)

[a] Values in parentheses indicate number of farmers.

Labour wages

Regulations

On 26 January 1983, the Government of Maharashtra enacted a regulation whereby the 8-hour wages for skilled and unskilled agricultural labourers were fixed as indicated in Table 4 (Maharashtra Administration 1983). The fact that there are as many as 6.4 million agricultural labourers has led to serious exploitation. Wage discrimination between the sexes has arisen from selective task allotment; in this way, men have been receiving INR 8–10/day, compared with INR 4–5/day for women. The government regulation, however, makes no distinction between the 8-hour work wages for men and those for women. Faced also with the frequent underpayment or nonpayment of wages, the labourer does not dare to express dissatisfaction. In Nandgaon, several labourers asked for higher wages; the employer simply warned them that if they were unwilling to work at his wages, he could employ labour from another village. When he did so, the labourers had to plead to be reinstated and are, therefore, now under an obligation to him. "It is better to take whatever little we get, than ask for more and get nothing at all," remarked one labour woman.

This issue was also brought out in a discussion with local labour inspectors, who, for various reasons, often felt defeated in labour cases. First, because the labourers themselves will not willingly file cases against employers, the inspectors find it difficult to do so. Of those labourers who became convinced and filed cases, most would not testify, for fear of retribution from their employers. Second, the use by employers of political power and pressures assists them either in withdrawing the case or in proving the allegation to be false. According to the labour inspectors, however, no complaints on sex-related disparity in wages have ever been raised.

Although viable legislation must be formulated, it is of equal importance that rural labourers be made aware of the existence of such legislation and be assured access to it.

Wages

Wages for cotton picking are paid according to the amount picked. This job (as with the picking of sunflowers) is done by women. They are paid INR 0.25/kg of cotton picked, and they manage to pick 20–25 kg/day, giving a daily income of INR 5–6. Some landlords claimed that the piece rate for cotton pickers was increased as the quantity of the standing crop decreased, and that the piece rate could rise as high as INR 0.75/kg. The labourers denied, however, that any change was made in piece

Table 4. Wages (in Indian rupees, INR) for skilled and unskilled agricultural labourers.

	Skilled			Unskilled		
Zone	Daily	Monthly	Annual	Daily	Monthly	Annual
1	12	400	4800	10	320	3840
2[a]	10	320	4000	8	260	3120
3	10	320	4000	7	230	2760
4	10	320	4000	6	200	2400

[a] Parbhani is in Zone 2.

rate through the season. For pulse picking, wages are paid in kind only, with every labourer given one-eighth to one-sixth of the amount that he or she collected during the day. Pulse harvesting lasts about 20–30 days, during which most of the labour families are able to collect their annual quota of pulses.

A very few labourers — all of them men — are on so-called "permanent" employment. Their salaries vary from INR 150 to 180/month. In addition to these wages, 80 kg of cereal grains, usually the hybrid sorghum, are provided by the employers; should the employers' store of grain be exhausted, they must, even if prices are high, purchase more from the open market to provide this "wage" grain. As with the daily wage labourers, this group of labourers is not entitled to any leave; payment is lost, therefore, for days of absence. During the rainy season, the "permanent" labourer must reach the field on time and remain there for the whole day to secure his wage.

With the introduction of modern, mechanized equipment for agricultural purposes, the landless, especially women, have been displaced from their jobs. Women have, for example, traditionally threshed the sorghum grains after harvest. Now, however, because the mechanized thresher that has been introduced is operated by the men, this job is no longer open to women. The net effect, in the nutrition context, of such mechanization has not yet been determined.

Credit facilities

None of the villages had any banks and, therefore, no facilities for credit. Ready cash is always a problem for small farmers and labourers on daily wages. Money is needed to purchase seeds, for marriages, during festivals, or during illness. The dowry system has burdened the small farmer and the landless population: grooms' families owning less than 1 ha of land demand up to INR 3000 in cash, in addition to other expenses that may amount to a further INR 3000. There exists a total dependence on the employer or the local moneylender for cash, often obtained at an interest rate of 5–10% per month.

In Kerwari, many small farmers have lost all their land (often less than 2 ha) to the moneylender: many of these loans were taken to finance a daughter's wedding, and were for an amount less than the value of the land itself. The only recourse open to such borrowers is to work for daily wages (often, ironically, on land previously owned by them) to collect money for repayment. This income is often insufficient both to meet daily needs and to save to repossess the land. The situation in Kathneshwar differs, however, from that in Kerwari: landlords (employers) often provide interest-free loans to their labourers; repayment of these loans is made over time through regular deductions from wages.

Postharvest activities

Agricultural production varies greatly. To survive in the bad years, it is necessary, in the good years, to have a surplus that will provide stored food, cash, or assets. Although this is possible for the large landholders who are less dependent on rains and often have good yields, the smaller farmers and even more so the landless live very precariously indeed.

Seed grain

After the harvest, a top priority is the storage of seeds for the next year's crop of sorghum. As the crop arrives, the good grains are stored with pesticides (mainly benzene hexachloride (BHC)) in large containers or gunny bags. Seeds for cotton and safflower are purchased from the local market by the small farmer and from the government distribution centres by the large farmer. Whatever the source, the small or marginal farmer always needs a loan for the purchase.

When purchasing seeds, it is only the large farmers who consider the consumer acceptability and market value of the selected variety; for small or marginal farmers, yield is the prime consideration.

Storage

All grains are stored within the household. The method of storage varies from village to village and also within villages. The grains commonly stored in this region are sorghum, green gram, and red gram. The structures commonly used for storage are gunny bags, baskets, pots, and bins, as described below.

Gunny bags

Gunny bag storage of cereal grains is popular for two reasons: it is considered economical (in Kerwari, the local ration-shop owner provides gunny bags to the farmers at INR 10/bag) and, because these containers are collapsible, more space becomes available in the storage room as the quantity of the stored grain decreases. The bags are easily damaged, however, and therefore must be replaced frequently.

Basket structures — kanagi

The *kanagi* is one of the types of container used to store large quantities of sorghum. Woven from cane strips and plastered with mud and cow dung, the capacity of a *kanagi* varies from 400 to 800 kg, depending on the crop yield and on the family status. Unlike similar storage structures of Andhra Pradesh (Pushpamma and Rao 1981), a *kanagi* is always placed indoors, and may be covered with a flat sheet made from cane, wood, or any convenient material; it is usually not sealed. A *kanagi* is a permanent structure, requiring some initial investment.

Stacked clay pots — utrandi

Smaller quantities of food items, such as pulses (mainly green and red gram), sesame seeds, and safflower seeds are stored in a series of mud pots, stacked in decreasing size (the largest at the bottom and the smallest at the top). This system of stacking pots for grain storage is called *utrandi*. The design, although simple, is such that the top pot fits perfectly into the mouth of the lower one, covering it. Even though the system is not airtight and no pesticides are added, pulses can be stored for 6–8 months without becoming infested. Interestingly, *utrandi* is the sole property of women; as a rule, men are not permitted to handle this system. The women, therefore, use it as a secret hiding place for their personal items and sometimes for money. After the harvest, they might hide a small amount of cotton in these pots, and sell it later for a higher price. This form of saving is useful in times of scarcity or when the money-lender demands loan repayments. *Utrandi* is common in Kerwari, Kathneshwar, Nandgaon, and Kanjalgaon. The capacity, determined by the number of pots stacked, varies according to the family's financial status.

Bins

Bins are also used for storage of small quantities of grains, most often dehulled pulses in the form of *dal*. Bins vary in size and are made of galvanized iron sheets with lids.

Grain losses

Grain losses can occur at various times and for various reasons (Fig. 3). The two most common reasons are fungal growth or rotting, and rodent or insect infestation. Losses may occur in the field because of unseasonal rains. After the harvest, the crops are spread out on the ground to dry before being threshed; rains during this period cause fungal growth, rotting, and germination; farmers quote these losses as representing up to 5% of the harvested crop. Losses of sorghum due to insect infestation are

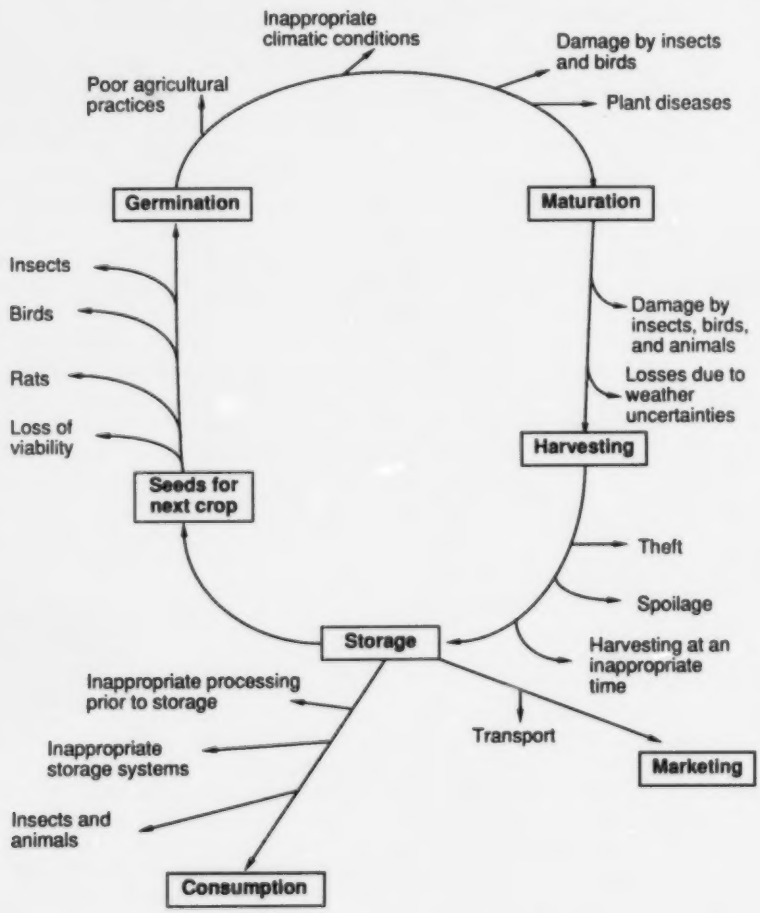


Fig. 3. Stages of grain losses (adapted from Boxall, 1986).

quoted as amounting to 15% of the stored crop. Unless the insects outnumber the grains, infested grain is still considered fit for consumption; by that point, most of the grain kernel will have been destroyed and, because the farmer believes in wasting nothing, the grain will be used as animal feed. Lightly infested grain is immediately washed and thoroughly sun-dried to reduce the level of infestation and retard its further development.

Although BHC may be added to the seed grain, the rural population does not add pesticides to grains that are to be consumed by the family. In the traditional method, dried *neem* leaves are added, and the grains sun-dried at least twice during the hot season. Grains can be stored for 8–10 months by this method.

With grain stored for seed purposes, better care is given to prevent insect infestation and to maintain viability. The protection given to the seed grain indicates an awareness on the part of the farmer of the risks of spoilage.

Pulses are believed to store better if oiled, dehusked, and split. The storage period for pulses is about 6–8 months.

Primary processing

Before grain legumes are stored, the women carry out home-level processing using simple processes and hand tools. For improved storage capacity and faster cooking, the legumes are processed into *dal*, or dehusked cotyledons. The process, although simple, is laborious, involving the following steps:

- Day 1 — The whole grain is soaked in water, to wash and slightly moisten it;
- Days 1 and 2 — The grain is thoroughly sun-dried;
- Day 3 — A small amount of oil is applied to the grains; and
- Day 4 — The husk is removed in a hand-operated stone mill or *chakki*.

The process of moistening and oiling is believed to make the task of dehulling easier. Some women lightly roast the whole pulse before applying the oil. For green gram, the process takes 3–4 days. For red gram, however, a more tedious process is required: because the husk of red gram is difficult to remove, oiling and dehusking must be repeated. The dehusking procedure is outlined in Fig. 4. Women are often able to dehusk 3 kg of green gram in 1 h. The oiled husks form a cake and are used as animal feed.

No primary processing is done on sorghum. Whole sorghum grains are milled at a local flour mill, weekly or fortnightly depending on family needs and resources. For subsequent preparation of *rotis*, a dough is prepared by adding cold water to the flour.

Food shortages

Although food shortages are often faced by the landless and small farmers, no famine has ever been recorded. The food shortages have been attributable mainly to a lack of financial resources and, during the last 3–4 years, to poor rainfall resulting in crop failures.

Low production means meagre stores that often become depleted before another crop appears. Assets are gradually sold for money or food commodities that are more expensive than at other times. The rural poor have learned, however, "to save for a

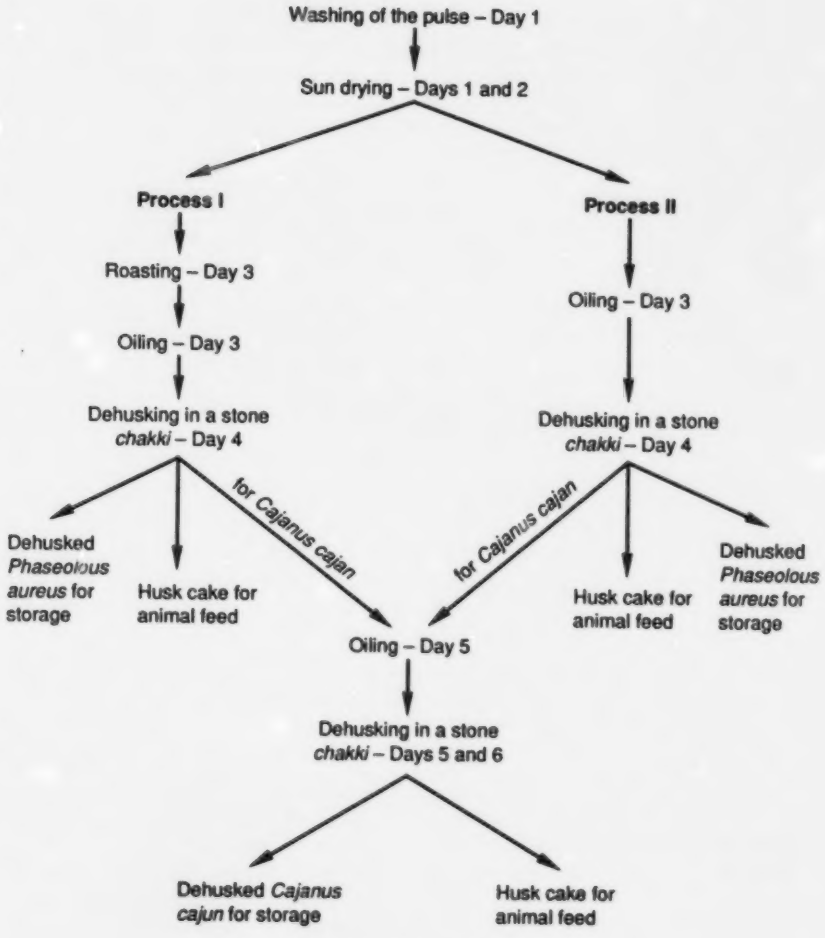

Washing of the pulse – Day 1
Sun drying – Days 1 and 2
Process I
Process II
Roasting – Day 3
Oiling – Day 3
Oiling – Day 3
Dehusking in a stone *chakki* – Day 4
Dehusking in a stone *chakki* – Day 4
for Cajanus cajan
for Cajanus cajan
Dehusked *Phaseolous aureus* for storage
Husk cake for animal feed
Husk cake for animal feed
Dehusked *Phaseolous aureus* for storage
Oiling – Day 5
Dehusking in a stone *chakki* – Days 5 and 6
Dehusked *Cajanus cajun* for storage
Husk cake for animal feed

Fig. 4. The dehusking procedure for pulses.

rainy day" (a phrase that in this case perhaps should be "to save for the dry days"). Some families store leftover *rotis* (thoroughly sun-dried) in baskets, to be consumed when food is short and to economize on stored grain. The dried *rotis* are soaked in water, softened, and eaten with the usual chili chutney. Bhogaji's family consumes such *rotis* at least once a month. Sorghum grains are sometimes boiled and consumed like rice; because the quantity of grain required by this method is less than that for *roti* preparation, families are able to economize on their stored grains.

In times of food shortage, stored pulses are exchanged or sold for sorghum. Only when all internal resources are exhausted and the shortage is protracted do the poor take out a loan. As mentioned earlier, this is usually obtained from the local money-lender, at a sizeable rate of interest. This debt adds to the miseries of the resource-poor, landless people of the region.

Marketing

Marketing involves the sale and purchase of goods, both food and nonfood. This activity is handled mainly by the adult male of the household.

Sales

Cash crops are sold to intermediaries soon after harvest, when prices are at a minimum; these sales are made in the nearby town or in the village itself. The intermediary bulks up the goods and sells in a larger market. By law, cotton can only be sold to the Cotton Federation of the Government of India. Prices vary between INR 5.50 and 6.80/kg. Because of the higher oil content of the seed, the Dharwad variety fetches the maximum price.

Small farmers sell sunflower and safflower in the local markets or at the weekly village bazaar soon after harvest. Large farmers with storage space may hold their produce for a few weeks until prices are higher in the nearby town. Safflower oil is by far the most popular oil for consumption in the region. As with sorghum, large landholders retain sufficient for the family's needs and sell the surplus. An oil extraction unit set up by a large farmer in Gangakher is used by the local people. In Nandgaon, the safflower oil is extracted at a price of INR 0.25/kg.

Large farmers store about 50–60 L of oil in sealed containers for the family's annual oil needs. Small farmers, however, can afford to retain no more than 10–15 L of oil. Lack of storage space and low resale value of oil prompts the small farmer to sell as much of the safflower as possible and to purchase oil as the need arises.

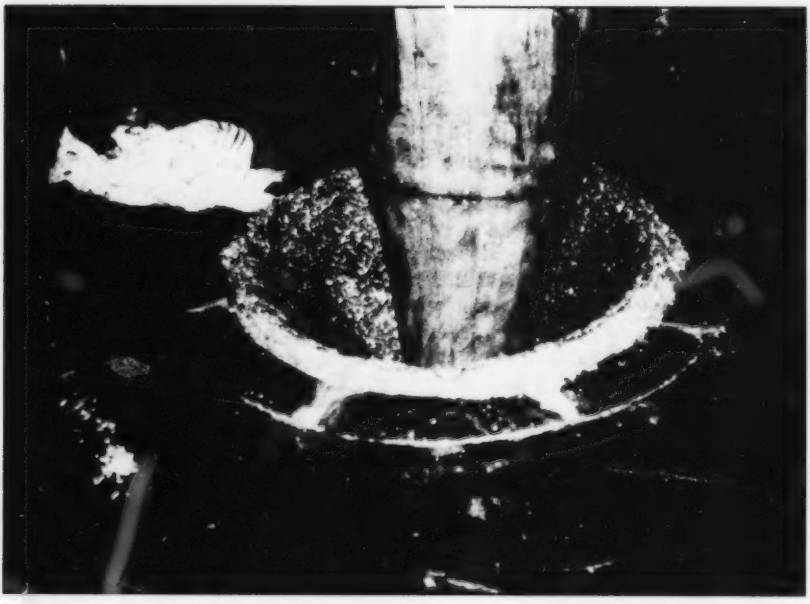
In Selu, in Pathri *taluka*, a mechanized *ghani* operates on a commercial basis. The owner purchases safflower not from individuals but in bulk from the local market. The extracted oil is sold locally to shop owners; no oil is marketed directly to families. In this unit, three *ghanis* are under operation for about 10 h/day. The oil is extracted in 8–12 batches, yielding about 70 kg of oil per day. The extracted oil is allowed to settle for 3–4 h and then filtered through a fine net to obtain a product that is clear and yellow. Recovered oil cake is sold in the local market as animal feed, fetching a price of INR 3.00/kg.

The small farmer sells stored green gram only when money is needed. The large farmer, however, sells green gram after harvest, keeping that required by the family and a little extra. A small farmer may sometimes be compelled to sell part of the produce to the moneylender to repay debts, particularly those incurred for the purchase of seeds. In times of need, stored pulse grain may be bartered at the village shop for other commodities such as sorghum, salt, and spices.

Data obtained from 110 families indicate that nearly 57% of landholders use their produce both for home consumption and for sale purposes. Of the landless labourers, however, 80% use stored "wage grains" for home consumption and 20% are forced to sell their stored food grains in time of financial constraint.

Interspersed among the crops are tall (1.8–2.4 m), single-stalked plants with cream-coloured flowers. This plant is called *ambadi* (*Hibiscus cannabinus*) or *gogu*. Oil is sometimes extracted from the seeds. The plant is highly fibrous, however, and farmers usually sell this fibrous material in the weekly bazaar; buyers use it to make ropes, and thus generate income at the home level.

Small-scale farmers buy and sell at the local market or the weekly village bazaar.



Mechanical ghani *is used to extract oil from oilseeds.*

Purchases

Although they try as far as possible to be independent with regard to the family food, marginal farmers and particularly labourers depend on the market for their food needs. Food grains, mainly sorghum, are purchased by the labourer in the open market (local shop or weekly bazaar) at rates that vary from INR 0.80/kg after harvest to INR 1.80/kg during the preharvest period. Because of the high price of edible oil, large families can often purchase no more than 1 kg of edible oil per month. Although local market prices range from INR 24 to 30/kg, as against INR 13.70/kg at the government ration shop, this ration quota allows only 2 kg/family, regardless of family size. Because of these high prices and the lack of agricultural employment, the nutritional risks are clearly great during the preharvest period.

Fair-price shops

Fair-price shops (FPSs) are outlets for marketing rationed and subsidized food commodities. In Parbhani district, there are 1674 FPS outlets, of which 219 are in urban areas and 1455 in rural areas. Each FPS caters to a population of about 2000. The FPS sells wheat, rice, sorghum, sugar, and edible oil on a fixed ration and at subsidized prices (Table 5) to its card-holders. The monthly quota per family is fixed by the government.

The subsidized commodities are obtained by the Food Corporation of India (FCI) and stored in *godowns*, or storehouses, at the district level (in Parbhani). The ration-shop owners collect their quotas as and when required. The payment system is complicated, however, and involves a nationalized bank, distant from the *godown*, for the receipt of payments. The shop owners may, therefore, spend up to 2 days in obtaining sanctions, making payments, and then returning to collect their food commodities. Because the profit margins under this system are minimal, most shop owners are discouraged from participating.

Some of the FPS owners revealed that their sales of wheat and rice are much greater than those for sorghum. Because sorghum is a locally produced grain, landowners obtain it from their own fields, and some landless receive it as wages. When there is a glut of sorghum, prices on the open market become lower than those at the FPS, whose prices remain fixed throughout the year. Grains that cannot be sold or can fetch only a low price in the local market are purchased by the FCI and eventually reach the FPS; the sorghum available at the ration shops is, therefore, usually of the hybrid variety, and one that, because of its small, dark grains, is not appreciated by the local population. Subsidies on coarse grains may be the most effective means of assuring adequate food supplies to the poorest households. When dealing even with very poor consumers, however, quality factors and grain characteristics are of prime importance.

Table 5. Comparison between food prices in FPSs and those of the market for comparable varieties.

	Price (INR/kg)	
Food commodity	FPSs	Market
Wheat	2.30	3.25
Rice	3.25	4.50
Sorghum	1.42	1.50
Sugar	5.10	6.00
Oil	13.70	24.00

This does not mean that there are no sorghum sales at the FPSs in the region. Sales are, however, limited. If the benefits of food subsidies are to reach the poorest and most vulnerable groups, the system requires such improvement as might be achieved through the following policies:

- The procedures for procuring food commodities by FPS owners should be simplified;
- The prices for all grains, especially sorghum, should be lower than the market prices at all times of the year;
- During risky seasons (e.g., preharvest), supplies should be made readily available and prices kept at a minimum;
- When market prices are high, a system should be in place whereby farmers are encouraged to sell better quality grains to the government, rather than in the local markets; and
- Agricultural inputs are required to increase sorghum yields per unit of land in the region and thus guarantee supplies.

Food preparation

In the villages, all household chores are performed by women, with scarcely any assistance from the men. Assistance is obtained from other female members of the family, from children, and sometimes from neighbours. Water and fuel must be collected, the household cleaned, clothes and utensils washed, food prepared, infants and older family members cared for, and wage-earning activities carried out. Occasionally, when the source is not nearby, male members of the family will assist in collecting water. (All villages, except Kerwari, have several bore wells in addition to the old, deep and shallow wells.)

The fuel used for household cooking is either dried wood or dried cow-dung cake. The wood, often twigs, is collected daily by the women before, during, and after work in the fields; these twigs are carried in neat, large bundles on the head.

In most cases, cooking activities are performed inside the poorly lit and ventilated houses. Although, in the dry season, some families cook outside their dwellings, the traditional *chulla* is generally preferred. This cooking unit is made from mud, with three closed sides and one open for adding the fuel; one *chulla* is always constructed inside the dwelling.

The main door is often the only opening in the house. As a result of this poor ventilation, smoke is trapped, making it impossible to stand for more than 15–20 seconds without suffocation and continuous watering of the eyes. The women have become habituated to this environment: when asked how they cope, they would promptly reply, "We perform all activities sitting because the smoke rises." If there is a positive aspect to this, it is that smoke serves to discourage insects, thereby enabling the grains to be stored for longer.

Smokeless *chullas* were seen in some houses in one village. However, because they require more fuel than do the traditional units — thus defeating the object of the *chullas* to be fuel efficient — they were not used. These smokeless *chullas* were, moreover, designed with double cooking sites that are not needed for regular cooking and serve only to waste more fuel: the poor usually cook only one item, i.e., sorghum *rotis*, and even pulse preparation is irregular. Although for such modest meal preparation only one small cooking site is required, no provision was made in the design of the smokeless *chullas* to obtain maximum efficiency with only one burner in operation.

Because of smoke from the chulla, *the women must sit while cooking.*

This is an example of research and development without consideration for the practical needs of the beneficiary. The urban researcher has, without prior consultation with the rural population or subsequent follow-up, designed and promoted a cooker that does not meet the needs of that population.

Meal pattern

Depending on the resources of the family, meals are prepared one to three times per day, each meal taking about 2 h to prepare. The cooking techniques principally used are boiling and roasting. Foods are rarely fried, unless by the richer families for festivals or marriages.

The most common meal among the marginal farmers and labourers consists of large sorghum *rotis*, served with a chutney of green or red chilies that have been formed into a paste with cloves of garlic and salt. Some families prepare a pulse every 2nd day. As an alternative to the pulse, a special preparation is sometimes made from bengal gram flour (*Cicer arietinum*) by mixing it in a thick paste with salt and red chilies and adding the paste to boiling water; the mixture is allowed to boil until thick, and is then eaten with sorghum *rotis*. With government efforts to promote wheat and rice through FPSs in the region, some of the richer farmers are shifting to wheat and rice consumption. They still prefer, however, to eat sorghum in at least one meal during the day.

Except when in season, green leafy vegetables are lacking from the diets. Labourers sometimes obtain raw vegetables from their employers' fields. There is,

therefore, little variety in the diet of the people of this region. To improve the health and nutritional status of this population, it will be necessary to promote sorghum as a staple grain that can compete with food products made from wheat and rice. Sorghum grain can be dehulled and made into flour. The dehulling of sorghum improves its nutritional as well as its physiochemical properties (Hulse et al. 1980; ICRISAT 1982). Various traditional wheat and rice recipes have been successfully prepared from dehulled sorghum flour, and these recipes are now being commercialized in Andhra Pradesh.

Infant-feeding practices

Breastfeeding is universal. Its duration varies, however, from 1 to 3 years or longer. (Parvati breastfed her younger son — the last child — until he was 7 years old.) Among landholding families, breastfeeding is started on the 3rd day after birth by 62% of mothers and on the 2nd day by 33% (Table 6). In the landless labour class, about 50% of the mothers start breastfeeding by the 2nd day after birth and an equal number by the 3rd day. A very small group of landholders start breastfeeding on the 5th day, a practice not observed among the landless. Because it is believed that lactation begins only after the 2nd or 3rd day, no effort is made to breastfeed earlier or to discard colostrum. Most mothers had not reasoned why breastfeeding was initiated only after the 3rd day; they had merely followed the instructions of the mother, mother-in-law, or other elder women. Most mothers fed undiluted cow's milk, often fresh (not boiled), for the first few days, before starting to breastfeed. Only if a child is born weak, and another lactating member of the family is willing to breastfeed this child, does an infant receive breast milk soon after birth. Overall, the information gathered indicated that the traditional beliefs are more strongly held by the landholders than by the landless population.

As a ritual, a few drops of honey are given to the newborn soon after birth. Some mothers also give a few drops of castor oil, a substance believed to act as a cleansing agent for the entire gastrointestinal tract.

Table 6. Infant feeding practices in the landholding versus the landless families.

	Landholders	Landless
Mothers initiating breastfeeding on		
Day 1	1 (1.5)[a]	—
Day 2	19 (29.6)	20 (47.6)
Day 3	41 (61.2)	20 (47.6)
Day 4	2 (3.0)	2 (4.8)
Day 5	3 (4.5)	—
Mothers breastfeeding for		
<2 years	6 (9.0)	1 (2.4)
2 years	24 (35.8)	10 (23.8)
3 years	28 (41.8)	27 (64.3)
4 years	2 (3.0)	1 (2.4)
5 years	1 (1.5)	1 (2.4)
Mothers introducing solid foods at		
10 months	26 (38.2)	6 (14.2)
12 months	38 (55.9)	28 (66.7)
18 months	2 (2.9)	3 (7.1)
>24 months	2 (2.9)	5 (11.9)
Total	68	42

[a] Values in parentheses indicate percentages; may not add to 100 because of rounding.

Of importance was the observation that commercial infant milk and weaning-food formulas had not gained popularity in any of the villages visited. The predominant reasons given were the prohibitive cost of these products, and their non-availability in the local shops; it would appear that if a low-cost food supplement (a cereal–pulse mix) for infants could be prepared from local ingredients and made available in village shops, it should be feasible to popularize it in the villages. Methods of preparation and precautions to be taken would, however, need to be communicated to the mothers or mother-substitutes. Unhygienic conditions and poor access to safe drinking water in these villages would possibly offset the benefits of early supplementation.

As noted above, breastfeeding is continued for up to 3 years and sometimes longer. A nutritionist or pediatrician would insist that, after 4–6 months, the output of breast milk is insufficient to meet the needs of the infant (Ghosh 1981). The rural mother believes, however, that this output is sufficient until the child is 1 year old. The popular indicator for insufficient milk output is the frequency of crying after breast-feeding (suggesting that the child is still hungry). This is believed to be the point at which "top" or supplementary feeding should begin. Top milk, frequently from buffalo, is diluted (1 part milk and 3 or 4 parts water) and then fed to the infant. Asked why the milk should be diluted at this point, when more food energy is needed by the child than was needed immediately after birth, the response was that "the older child needs more (quantity and quality). However, a larger quantity requires more money. To fill the stomach of the child, so that he does not ask for more too soon, the quantity is increased by diluting the milk." Thus, we see the effect of poverty on patterns of child feeding.

Breastfeeding may be stopped gradually or abruptly. The reason for discontinuation is often the next pregnancy. Mothers who discontinue abruptly do so by applying chilies or other bitter-tasting substances to their nipples. Babies are breastfed only on demand; the mothers follow no schedule. While breastfeeding, the mothers always continue their household chores; rarely would any woman take time out and sit relaxed to breastfeed her infant. As a result of decreased milk output, or of abrupt discontinuation of breastfeeding without provision of sufficient top milk or other foods, growth-faltering usually begins around 6 months of age; it is then that the visual signs of malnutrition appear.

It is of utmost importance that, at this age, the child receive sufficient care and feeding. Such feeding might include infant foods that are high in nutrients and calories. The way of life of most poor families does not, however, permit the preparation of such foods, especially in the labour-intensive period, when the mother's working hours are long and tiring. During the daytime, infants are often left in the care of the grandmother or an older sibling. With breastfeeding reduced, the infant begins to nibble at small pieces of *roti* or, if available, biscuits. The concept of "weaning" is absent: infants graduate to adult food directly from breast milk. It is imperative that cheap and nutritious infant-food preparations be formulated from locally available ingredients. The preparation techniques should be practicable for home-level processing, and easy for the mother-substitute to prepare. We learned from Ganpatrao (the shopkeeper) that sweet or savoury snack foods are eaten by the children, but are never bought for infants under 1 year of age.

In most families, solid foods are introduced into the infant diet by the time the child is 1 year of age (Table 6). As mentioned earlier, however, these foods are usually unsuitable for infants and inadequate for their nutritional requirements; no special foods are prepared to meet these requirements. It is also important to note that the

village community has no strict concept of time as we understand it: 10 months could equally mean 12–15 months. Infant-feeding practices could be modified by education schemes; socioeconomic conditions and local concepts of time must be taken into account, however, and such schemes must be carefully designed.

Food fads and taboos

Cultural food fads and taboos commonly affect the period of gestation and lactation and may exacerbate certain illnesses in infants.

The need for increased food intake during pregnancy and lactation is not recognized; on the contrary, women eat less during pregnancy. This is not only because of decreased appetite, but is also the result of a desire to restrict the size of the baby and thus avoid a difficult childbirth. This decreased intake contributes to low maternal weight-gain during the gestation period and, because of a retardation in fetal growth, to the resultant low birth-weight of the infant. Such an infant is thus disadvantaged before his or her life has even begun.

During pregnancy, the foods commonly avoided are papaya ("causes abortions"), sesame seeds ("induces bleeding, resulting in abortions"), and jaggery ("hot food, causes abortions"). No special foods are prepared for the pregnant woman, and her diet remains essentially unchanged throughout gestation. The only change at all would be a reduction in food intake to counteract nausea and vomiting.

Because sorghum *rotis* are believed to cause discomfort due to fullness and are, therefore, avoided for 1 week after delivery, the family often has to purchase rice or wheat at this time, thus increasing its expenditure on foods. Such food fads can exacerbate dietary deficiencies at a time when body requirements are even higher than usual. Nutrition education programs are needed to further examine and modify this situation.

During the initial 2 months of lactation, intake of chilies and spices is restricted; these food items are believed to cause changes in the breast milk, leading to diarrhea in the breastfed infant. Because it is believed that water intake will increase if salt is consumed, resulting in bloating of the mother's stomach, salt intake is restricted for at least 5–7 days post partum. The diet of the lactating mother, therefore, consists of milk, gum, clarified butter, homemade vermicelli, and sugar. Generous helpings of fenugreek seeds (*Triogenella foenumgraecum*), garlic, dry ginger, and seeds of garden cress (*Lipidum sativum*) are also traditionally recommended. All these items are believed to have galactogenic properties. Because most poor families cannot afford them, they may be received as gifts to the new mother from her maternal home.

In urban areas, breastfeeding is being promoted by emphasizing its contraceptive effect as well as its benefits as a clean, complete, and natural food. Although the mothers in the villages strongly believe that no food is better than breast milk for their infants, they do not believe it has a contraceptive effect because most had conceived while breastfeeding. (It should be noted that, in most cases, conception had taken place 18–24 months after the previous delivery.)

Although traditional beliefs largely determine the types of food given to the infants and the timing of these feeds, cost and availability are also relevant factors.

Food taboos also come into play during illness. During bouts of infant diarrhea or febrile illness, for example, foods and fluids are frequently withheld from the child.

This results in starvation and dehydration, extreme weakness, and prolonged and aggravated illness.

It was interesting to note that these beliefs are more strongly held by the large landholders than by the landless who, probably because of the pressures for survival, seem to break away from cultural beliefs more easily.

Nutrition and health facilities

Except for a very small school feeding program in operation, government nutrition programs are nonexistent. The Integrated Child Development Services (ICDS) program was initiated by the Government of India in 1975 to provide a package of health, nutrition, and education inputs; this is not operative in the villages, nor were there any *anganwadis* — village-level centres of the ICDS.

School feeding program

In September 1985, a school feeding program was initiated for school children in the 1st standard (5–6 years of age). This program had two objectives: to encourage enrollment and to provide a food supplement at a time when the region faced food scarcity. In the following year, this program was extended to children up to the 4th standard (9–10 years of age) in all single-teacher schools, but kept to those in the 1st standard in multiple-teacher schools. In 1987, there were 57 716 beneficiaries from 1509 schools in the 1650 villages constituting Parbhani district. Two types of supplements were provided under the program: corn–soy–milk powder (CSM), manufactured under the trade name "Sukhadi" by the Maharashtra State Cooperative Marketing Federation Ltd in Bombay, and fresh milk, distributed by local milk cooperatives in the villages.

The total number of beneficiaries for the CSM supplement was 43 857, and all received the supplement between July and December 1987. The program has now been discontinued, and the school authorities are not hopeful of its return: it seems that, although the children liked the supplement, they often took it home to share with their siblings.

The milk distribution program is highly inefficient. Milk can be bought only from registered milk cooperatives. Not all villages have such cooperatives, however, and, because the milk-sellers can obtain a higher price in the city, not all cooperatives are willing to sell milk for the school program. Of the 13 819 beneficiaries in 48 schools marked for milk distribution, only 3231 receive 150 mL of milk for 20 days each month. Depending on the enrollment in the schools, the number of beneficiaries varies from 5 to 157 per school.

The program is nontargeted. Although children from the landless families are more vulnerable to malnutrition, the program benefits a greater number of children from landholding families. The main reason for this discrepancy is the difference in the number of enrolled children from the landholding and the landless families: because children from the latter group are expected to assist their parents in wage-earning activities, there are fewer attending school. The program, moreover, benefits boys more than girls, who attend school less regularly: we observed that the proportion of boys to girls in the enrollment gradually changes from 60:40 to 75:25 or 80:20 between the 1st (5–6 years of age) and 6th (11–12 years of age) standards. (Many girls are married before the age of 13.)

During the 6-month operation of the feeding program, the total expenditure by the district-level school authorities for CSM was INR 1 906 818; the cost of milk distribution was INR 150 930 during the same period. These programs have clearly not succeeded in achieving their planned objectives.

Health facilities

Although there is a primary health centre (PHC) within 10 km of each village, and a subcentre in Kathneshwar village itself, PHC services are underutilized. Services at PHCs in some villages are not used because villagers have frequently returned without receiving any medical treatment. Sometimes medicines are not available; at other times, the doctor is unavailable. The villagers prefer to visit a private doctor nearby rather than travel the distance to the PHC and face these problems.

One subcentre is run by a lady health visitor. Although she carries such items as iron folate tablets and vitamin A capsules, no families reported receiving these; indeed, cases of vitamin A deficiency were observed in this village together with several cases of Bitot's spots in children, and some night blindness in women. All women, men, and children complained of general weakness and tiredness. A few infants (18–36 months of age) were marasmic. Overall, there were clear indications of undernutrition among the study population. The most extreme cases of nutrient or food insufficiency were found among families of the marginal farmers and of the landless.

These observations are supported by some secondary data sources. In a study conducted on 200 children (3–6 years of age) in Parbhani, vitamin A deficiency was reported in 17.5% of cases, of whom 16% suffered from Bitot's spots (Agresco 1987). Kwashiorkor was noted in 4% and marasmus in 1% of the children. Some children also had vitamin B and D deficiencies. Common ailments related to gastrointestinal infections (38%) and respiratory diseases (31%) were reported.

In a study by Bakshi (1987) on 500 preschoolers in rural Parbhani, fewer than 2% of subjects were normal by Gomez's classification, based on height, weight, and weight-to-height ratio. About 1% were normal by Waterlow's classification, which is based on height-for-age and weight-for-height measurements (Appendix II). By the Gomez and Waterlow classification, 63% and 76%, respectively, were classified into grades II and III of malnutrition. The prevalence of malnutrition relates directly to family income (Table 7). No trend was observed, however, with respect to the prevalence of malnutrition from 3 to 6 years of age (Table 8).

Table 7. Effect of family income on the prevalence of malnutrition among selected rural preschoolers.

Family income (INR/month)	Ratios for classification of children (normal (N) and malnourished (M))						Number of subjects
	Weight-for-age		Height-for-age		Weight-for-height		
	N	M	N	M	N	M	
<500	2 (0.7)[a]	261 (99.3)	5 (1.9)	258 (98.1)	5 (1.9)	258 (98.1)	263
501–1000	20 (14.0)	122 (86.0)	10 (7.0)	132 (93.0)	10 (7.0)	132 (93.0)	142
>1000	45 (47.4)	50 (52.6)	18 (19.0)	77 (81.0)	31 (32.6)	64 (67.4)	95

Source: Bakshi (1987).

[a] Values in parentheses indicate percentages.

Table 8. Effect of age on the prevalence of malnutrition among selected rural preschoolers.

Age group (years)	Ratios for classification of children (normal (N) and malnourished (M))						Number of subjects
	Weight-for-age		Height-for-age		Weight-for-height		
	N	M	N	M	N	M	
3–4	21 (11.6)[a]	161 (88.4)	11 (6.0)	171 (94.0)	12 (6.6)	170 (93.4)	182
4–5	20 (15.0)	113 (85.0)	14 (10.5)	119 (89.5)	17 (12.8)	116 (87.2)	133
5–6	26 (14.0)	159 (86.0)	8 (4.3)	177 (95.7)	17 (9.2)	168 (90.8)	168

Source: Bakshi (1987).
[a] Values in parentheses indicate percentages.

None of the children were reported to have been immunized. Although some mothers did mention that their children had received vaccinations at school, they were unaware of the specifics.

Coverage under nutrient supplementation program

There are two supplementation programs in operation in the district: the National Nutritional Anemia Prophylaxis Program (NNAPP) and the Prophylaxis Against Vitamin A Deficiency Program.

Statistics obtained from the District Health Office in Parbhani indicate that, in 1985–86, the number of women beneficiaries receiving the iron folate supplement exceeded the number targeted. This figure dropped, however, to 95% in the following year. For children, the coverage was 64 and 89% during 1985–86 and 1986–87, respectively, under NNAPP.

The second program, targeted at children and designed to prevent blindness due to vitamin A deficiency, provides two massive doses of vitamin A per year. The reports indicated a coverage of 75% of the target group.

Availability of oral rehydration salts

In Parbhani, packets of oral rehydration salts (ORS) have been made available to most PHCs through a program of the United Nations Children's Fund (UNICEF). These packets were not, however, necessarily being distributed to those suffering from diarrhea. Many of the women appeared, moreover, to be uninformed as to the technique for preparing or making the solution at home. Our observations indicated that, although most community-level workers at the PHC understand this technique, they fail to communicate it to those mothers whose children suffer from diarrhea.

Traditional practices

The principal ailments reported were coughs, colds, fever, and diarrhea, the latter frequently occurring in children. The sick are usually taken to a doctor only after the condition becomes extreme; the ailment is expected to subside by itself or with the assistance of local remedies.

In some villages, it is still believed that illnesses can be caused by evil spirits and by the curse of the Goddess. Ceremonies to please the Goddess are commonly performed, especially during illnesses of children. There are different goddesses for

different age groups; children are considered to be the most vulnerable to the curses. In one of the ceremonies, a *parath*, or flat metal dish, and a coin are used. The traditional specialist chants mantras in praise of the Goddess and asks for forgiveness on behalf of the sick. The entire ceremony is performed by this specialist, who holds the coin in her closed palm throughout the rituals. A small amount of *kumkum* (vermilion powder) is then placed on the coin. If the coin sticks to the *parath* when the latter is held in a vertical position, the illness is confirmed as being a curse of the Goddess. If the coin does not stick, then the ailment will be attributed to more earthly causes. It must be remembered, of course, that an object held in the closed palm for some time would become coated with sweat and that the addition of *kumkum* could form a paste that would stick the coin to the metal plate.

If the result is positive, forgiveness ceremonies are performed. These may include certain feeding regimes for groups of children or married women, and visits, with offerings, to certain temples of the Goddess. If the illness is not cured within 1 week of these ceremonies, the sick person is taken to the doctor. Other traditional practices deal with curses said to cause infertility. The positive versus negative effects of such practices on family health and nutritional status need better definition; such research would greatly assist in designing future education programs.

Caste distinction

Differentiation by caste is very common. The houses of the *harijans*, or lower castes, are segregated, often in such a manner that these people need not enter the rest of the village. As in other villages, Kerwari has a separate *harijan* enclave, or *basti*. Twenty-five *harijan* families, with a total population of 150 people, live in mud houses, most of which have thatched roofs. Two or three of these houses have stone walls. The lower castes traditionally include tailors, wood cutters, carpenters, cobblers, and blacksmiths. In addition to performing their traditional occupations, the men now work as labourers on daily wages. One family did own a small piece of agricultural land; this was, however, an exceptional case.

In Kerwari's *harijan* area, there is only one well for drinking water. With the scant rainfall in the previous summer, this well dried up, and the *harijans* had to bring water from wells outside their locality, a practice forbidden them. With no alternative, they literally had to fight to obtain this water.

One of the lowest castes is the *mahar/mank* caste. Its members are traditionally responsible for removing dead animals, a function that higher castes would never perform. In earlier times, the income of the *mank*, in addition to the food sometimes received as partial payment, came from the sale of dead animals' skins. Times have changed, however, and the *mank* is now required to pay INR 100 for each dead animal taken. This change has come about through a realization that a substantial profit can be made from the sale of cured skins.

Mass media

India has a widely expanding network of television centres and relay stations. There were 18 stations and relay centres in 1976; 10 years later, there were 181 such stations and centres. With all 181 stations and relay centres hooked onto the national satellite system (INSAT 1B), Doordarshan (Indian television) now reaches more than

50% of the Indian population, or 382 million people, of whom 259 million are in the rural areas. In the state of Maharashtra, television is seen by 30 million people, 12 million of whom live in rural areas.

Many villages in the state have television sets provided by the local *panchayat* (rural government) for community viewing. Although some village sets are installed only in the residence of the *sarpanch* (leader of the *panchayat*), most villagers manage to watch selected popular programs. A small number of rich farmers have television sets in their own homes.

Because television with its visual impact is now widely used even in the rural areas, there is particular scope for organizations to promote health and nutrition messages concerning women and children through this medium. These messages could be designed to discourage harmful practices, such as reducing food intake during pregnancy, avoiding the local staple (sorghum) after delivery, and withholding food and fluids during illness, and promote those that are beneficial, such as post-partum consuming of high-calorie food and increasing maternal food intake during lactation.

During the course of our appraisal, we were, to some extent, able to assess the impact of these messages on the rural population. While discussing health facilities, utilization, and home remedies, it was discovered, for example, that some mothers were familiar with ORS preparation and were able to quote the proportions of salt and sugar to be added to water; these mothers recognized the need to feed the mixture frequently to a child with diarrhea. When asked how they had learned this practice, they said "We have seen it so often on the television." From this experience, and from the many others cited (UNICEF 1988), we can see the potential impact on health and nutrition improvement of social marketing through mass media, especially television.

This channel of communication could, moreover, create a general awareness of agricultural practices, marketing techniques, legislative rights, subsidies available, the role of women, and opportunities for rural development.

4 *Improvement strategies*

The rural landless

The food system and limitations of the landless are depicted in Fig. 5. Because of their variable access to food, landless families are especially vulnerable to malnutrition.

In the seventh 5-year plan (1985–90), the Government of India extended the ongoing income-generation programs, referring to them as the "programs with direct attack on poverty." The main national programs are:

- The Integrated Rural Development Program (IRDP) — an individual household program for income generation;

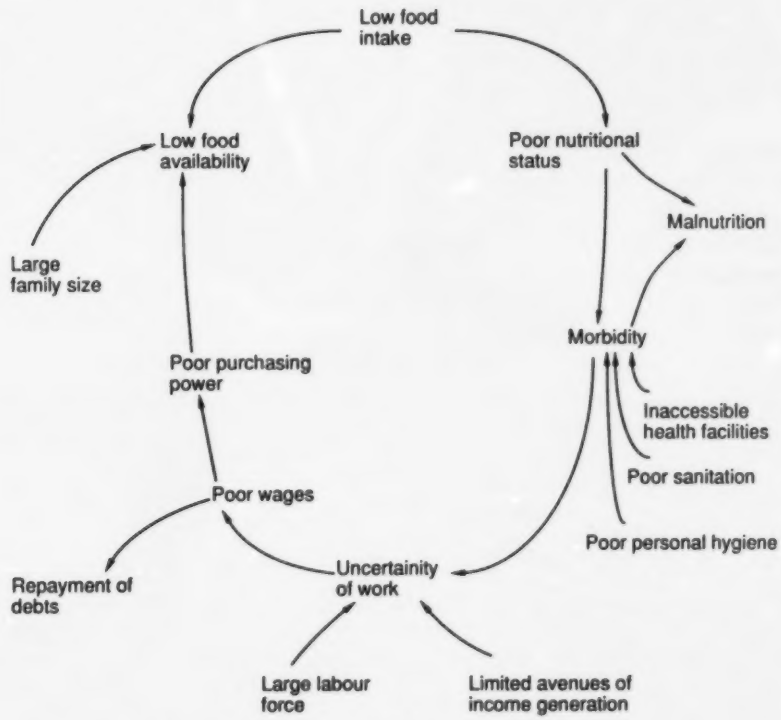


Fig. 5. Food systems and limitations of the rural landless.

- The National Rural Employment Program (NREP) — a program of direct, supplemental-wage employment, replacing the earlier Food for Work Program (FWP); and
- The Rural Landless Employment Guarantee Program (RLEGP) — a program of direct, supplemental-wage employment.

The IRDP was initiated in 1978–79 in 2300 developmental blocks and extended to the entire country in October 1980. The NREP replaced the FWP at about the same time. Except for the RLEGP, initiated on 15 August 1983, these programs have, therefore, been in operation for nearly a decade. Bagchee (1987), reviewing poverty alleviation for the rural sector, has observed that these programs suffer primarily from a lack of conceptual clarity and from an inadequate understanding of the complex nature of the environment in which they must operate. For these reasons, the programs have not been successfully implemented.

Because of leakage and poor targeting, the NREP has not brought about any significant, positive, impact on the nutritional status of the rural poor. There has been discord concerning the type of grains to be used: the coarse grains are preferred in the region over the wheat or rice that is supplied. This has resulted either in poor acceptance of food grain or in resale after procurement. The quality of the supplied grain has, moreover, often been poor, as is the case with grain marketed through the FPSs.

Although these programs were in operation in the study region, no attempt has been made to assess their magnitude or effectiveness. Furthermore, secondary data were not available on their costs and benefits. A program that has been better researched, however, is the Employment Guarantee Scheme (EGS), in operation in Maharashtra since 1972. An evaluation of the EGS indicated that the scheme has made considerable impact on the employment situation of the "weaker sections," particularly the landless and female workers (Dandekar 1983). This evaluation also indicated that female employment could have substantial benefits on child nutrition. In a quantitative study, Walker et al. (1986) indicated that, in the EGS villages, the seasonal variation in income was half that in non-EGS villages. This suggests that a public-works program such as the EGS can be most effective in protecting poor rural households from income variability. Although the EGS was initiated as a program to provide seasonal employment, it is now a "regular" employment program.

The EGS has generated 200 million person-days of work in Maharashtra, compared with 250 and 236 million person-days of employment generated at a national level through the NREP and the RLEGP, respectively. The relative success of the EGS indicates the potential of such programs to improve the nutritional status of vulnerable households and individuals. The schemes depend, however, on appropriate targeting, and must be attractive enough that the rural landless seek them out (Subbarao 1987).

Programs such as the NREP, RLEGP, EGS, and FPS exist to assist the rural poor in rising out of impoverishment. They rely, however, on government finances and management, and may not be sustainable. They should, ideally, be temporary measures only, to assist in the rehabilitation and resettlement of the landless; as self-sufficiency increases, programs should be retargeted to more needy groups. Although food subsidies and supplements are essential (especially if targeted to the vulnerable groups and linked to rehabilitation programs), it is imperative that long-term strategies be designed to increase the resources of the poor.

Food security and food policy

Cyclical food shortages can occur in an agricultural economy. Fundamental to a concept of food security is the management of the food economy so that external assistance is not required in such periods of shortage. Efficient distribution is an integral part of any food security system: surplus stocks held by the government will be of little use if they cannot be supplied at the right time; if, moreover, people do not have the purchasing power to buy the grain, then its availability will have little significance.

The history of food shortages indicates that it is the failure of the *rabi* crops (due to a lack of late September rains, together with subsequent winter showers) that is responsible for poor crop yields and food shortages (Acharya 1983). Only a moderate rainfall is required to produce a normal yield of the principal *kharif* coarse grains, such as sorghum and millet. Throughout the western belt, extending from north to south India and comprising Rajasthan, western Madhya Pradesh, Gujarat, Maharashtra, Andhra Pradesh, and Karnataka, a rainfall of only 50–55 cm, if properly distributed over the season, is adequate for a normal crop of *kharif* coarse grains. This emphasizes the value of the coarse grains as drought-resistant crops.

The first committee on food-grains policy in India was established in 1947. This committee examined the means of increasing domestic production, the extent of imports, and modifications required in the food-grains policy. One of its recommendations was for a government reserve of grains. Because coarse grains such as sorghum and maize were believed to be subject to rapid deterioration, the reserve was to comprise mainly wheat and rice.

In a meeting of the planning commission in May 1972, it was suggested that the food-grain stocks held by the Food Corporation of India should be classified into three categories: operational (minimum quantities required to maintain the public distribution system), buffer stocks, and surplus (Acharya 1983).

Neglect of the coarse grains

The inhabitants of the Indian drylands, including the people of Parbhani district, would benefit from certain alterations in India's food policy. Although the "Green Revolution" has enhanced the production of wheat and rice, sorghum, millets, and pulses have been neglected. Where the climate is favourable and irrigation facilities are available, economic development has, therefore, far outstripped that of the rain-fed regions.

Although nearly 25% of India's cultivated land is used to produce coarse grains, contributing roughly one-third of the total food-grain production of the country, the coarse grains have not, in terms of increasing yield, quality, marketing strategies, and price support, received the attention that have wheat and rice. Acharya (1983) offered several reasons for this phenomenon: in particular because coarse grains do not command an all-India market, the demand is limited to the area in which they are produced, and these grains deteriorate rapidly. In addition, coarse grains are the staple food of the poorer sectors, and prices will increase if supplies are withdrawn on a large scale to build a national food-grain stock. In Maharashtra, however, and particularly in Parbhani district, sorghum is not a poor person's grain: although the quality of the grain consumed may differ with varying socioeconomic status, it is the preferred staple grain for all, rich and poor alike. Large-scale government procurement of this

grain would, in fact, ensure a fair price to the farmer, who would be encouraged to grow more of the crop.

In Maharashtra, a public agency, Markfed, has begun to undertake price-support purchases for sorghum. In recent years, this has encouraged many large farmers to sell their sorghum to Markfed. In the year before this study, drought drastically reduced the sorghum crop and affected the quality of the grain, but the prices fixed by Markfed (higher than those offered in the local market) sustained the farmers and enabled them to make a marginal profit. Without expansion, however, the Markfed operations will not be able to meet demand.

5 Conclusions and recommendations

In addressing the objectives of this RRA study, we have classified the conclusions as follows:

- Target groups for nutrition intervention;
- Long-term strategies for nutritional improvement;
- Short-term strategies for nutritional improvement;
- Operational plans;
- Future research needs; and
- The use of RRA in nutrition programing.

The insights gained from this study are likely to be applicable throughout the dryland regions of western India, extending from Rajasthan in the north to Karnataka in the south. Similar agricultural techniques and practices are used throughout these regions. The techniques and practices are characterized by a dependence on rainfall, consumption of coarse grains (mainly sorghum and millets) as staple foods, impoverishment, exploitation of labour, extensive landlessness, and the poor nutritional status of the rural population. It is suggested that the basic format of the present study could be replicated or adapted for the rapid identification of problems affecting nutritional status in other communities and regions.

Target groups for nutrition intervention

The study enabled specific groups that require special assistance for nutritional improvement to be identified. These groups include women, infants and preschool children, landless families, and low-caste *harijans*.

Women perform the dual tasks of household management and income earning. Because of the tedious and time-consuming nature of the procedures followed, household chores cause a great deal of physical and mental fatigue. Frequent childbearing and a lack of recognition of increased food needs during pregnancy and lactation make the women especially prone to ill health and malnutrition. The double burden of household and wage-earning activities leaves women little time for child care. The observations indicate that employment does not lead to early discontinuation of breastfeeding. These women do not, however, practice supplementary feeding; rather, the provision of adult foods is begun abruptly, usually after the infant is 1 year old.

These inadequacies in maternal and child feeding are exacerbated by certain traditional practices and beliefs that have negative effects on health and nutrition, particularly for pregnant and lactating women. Fear of childbirth, together with inadequate medical facilities, psychologically influence women to restrict food intake during pregnancy and thus produce neonates of low birth weight. To offset beliefs that act as negative influences on child growth and on overall health, appropriate messages

should be designed and communicated to the women. Such interventions could be orchestrated without involving gross changes in prevailing economic and political systems in the region.

Of the study population, about 38% are landless families and 30% own less than 2 ha of land. Members of such families are liable to suffer greatly both from variations in the price of food and nonfood commodities and from seasonal nonavailability of employment. At certain times of the year, high prices coincide with lack of employment opportunities; the fact that there are seasons of particular nutritional risk for these groups should be accounted for when planning interventions.

The *harijans* (low caste) are especially vulnerable. They are usually landless and are neglected by the village community. Because they have least access to any facility, they are the most prone to health and nutritional problems. Despite government efforts to provide special programs and services to these groups, entrenched attitudes remain.

Long-term strategies for nutritional improvement

Malnutrition is inextricably linked to poverty in the region. The most effective long-term measures would comprise policies for sustainable prices or incomes. Such policies would relate to three areas: employment and income generation, food subsidy and the ration system, and the environment.

Employment and income generation

The study indicated that various government employment-generation schemes have operated in the region. Of these, the EGS has been the most effective and should be extended. The NREP and RLEGP programs require drastic modifications. Of concern is the failure, despite substantial personnel and financial investments, of the latter programs to provide tangible assets to the poor and landless. The shortfalls occur at the field level, demonstrating the urgent need to improve field management in the programs. Food-for-work schemes are also important for providing local food grains, preferred over grains imported to the region.

Priority should be given to programs aimed at creating viable, wage-earning opportunities, particularly for the landless. Small enterprises, based on agroprocessing, could play an important role in using local resources. With appropriate training and access to credit and services, entrepreneurial spirit could be kindled in individuals and small groups.

It was clear from observations made during the study that income obtained by women is used for home needs and child care. The women have even developed systems, inaccessible to the men, for concealing this income. Opportunities for women's enterprises were seen in the following areas:

- Producing dehulled sorghum flour as a raw material for secondary processing;
- Processing dehulled sorghum flour into baked goods, vermicelli, *papads*, *murukkus*, and other products;
- Poultry and dairy development at the village level to satisfy the high demand from nonvegetarians and to replace costly products purchased by villagers from nearby *talukas*;
- Preparing supplementary infant foods from sorghum, millet, and pulse mixtures;

- Extending the manufacture of handicraft and hand-loom items, such as baskets, brooms, and *kanagi*; and
- Increasing the production of *ambadi* for the manufacture of ropes.

The increasing production of oilseeds, such as sunflower and safflower, in the region offers opportunities for generating employment and income by establishing community oil-extraction facilities. The processing of oilseeds at the village level should also increase the local availability of calories, reduce costs of edible oil, and, of equal or greater financial benefit, produce valuable feed cake for animals.

To build profitable enterprises, the villagers must be able to gain access to credit facilities; those with meagre resources are most in need of credit at low interest rates. The absence of such a facility has encouraged exploitation and increased the dependency of the poor on rich farmers and moneylenders, who charge excessive interest on loans. The community discussions and observations did not reveal any lack of drive or interest on the part of the villagers. On the contrary, the limiting factor is the lack of a minimal amount of capital. The procedures of the Grameen Bank in Bangladesh should be studied for possible application and testing in the study region: the experience of this financial institution disproves the notion that the poor always represent an unacceptable credit risk in banking (Hossain 1988).

Other services needing to be integrated with income-generating schemes include training in technical and basic management skills, assistance with product marketing and distribution, and maintenance and supply. In creating economies of scale and competitiveness, it is important that ways of linking village enterprises be elaborated.

We cannot overemphasize the importance of stimulating market demand for locally produced grains such as sorghum. Such demand will further stimulate the production process and catalyze the economic development of the study region.

Food subsidy and the ration system

Although ration systems are relatively expensive forms of nutrition intervention, they offer extensive coverage and effective means of alleviating malnutrition. The rationing of rice in Kerala, India, and in Sri Lanka was shown to have a significant effect on the nutritional status of the poor in those regions (Gwatkin 1979). Of concern, however, is the potentially negative effects of rationing and of subsidization on farmers' incentive and on agricultural production. Government policies should aim to provide price support to farmers, to encourage internal production, and to reduce dependency on imported grains.

The present study confirmed that subsidies can make an important contribution to nutritional improvement: the poor are allowed access to more food per unit cost, and their family food intake is thus increased. The FPSs have, unfortunately, been dealing mainly with wheat and rice, rather than with locally produced sorghum. Large farmers (with irrigation facilities) wishing to sell to the government procurement system have tended to shift to wheat production. Small sorghum farmers are, however, unable to enter this market. Sorghum is also afforded a low status in view of its association with poor quality and with the diet of the poor. Sorghum should be seriously considered as a candidate for subsidy: this would represent a nutrition intervention targeted to the poor.

In the move toward a more extensive stocking of sorghum by the state government, a start has been made with the appearance of Markfed, a public enterprise

currently purchasing sorghum grain. To support this move, assistance to farmers should be increased in terms of technical inputs, seed supplies, and storage facilities.

Government-procured sorghum should be used in national programs. It is unfortunate that the NREP, a program that has been fairly active in the Parbhani region, is losing credibility because of the marginally acceptable grains provided as wages. The NREP outlet could provide a ready market for farmers producing sorghum in the region.

The channeling of sorghum through the public distribution system, making the grain widely available at the FPSs at subsidized prices, would improve access to food for the more vulnerable groups. It would also help to maintain food security for poor families during seasons of food scarcity, elevated prices, and nonavailability of employment. Public procurement and distribution systems should pay particular attention in this region to lessening the risk of malnutrition in the target groups during the preharvest season.

The environment

Characteristic features of the Parbhani region include substantial environmental deterioration, poor agricultural conditions on marginal lands, and prolonged drought. For long-term rehabilitation of the most malnourished, improving the well-being of the population should be combined with developing the environment and its productive capacity. Sustainable improvement in nutritional status will be achieved only in the context of the renewable resource system. A discussion of environmental issues is beyond the scope of this report; it may be said, however, that plans for building nutrition intervention must include the development and implementation of viable measures for land reclamation, resettlement, water conservation, agroforestry, and productive farming systems.

Improvements in environmental sanitation, with provision of drains, latrines, and safe drinking water close to the households, would benefit the community as a whole. Safe housing and easy access to fuel are also essential prerequisites to nutritional betterment.

Short-term strategies for nutritional improvement

There are indications of extensive nutritional deficiencies (particularly protein–calorie, vitamin A, and iron) in the Parbhani region; specific interventions to counteract these deficiencies may be appropriate. Measures that could be recommended include anemia prophylaxis, vitamin A supplementation, and supplementary feeding for infants and for pregnant and lactating mothers. Such programs are costly, however, in terms of both human and financial resources, and are difficult to sustain. As shown during the study, direct interventions to supply nutrients to the malnourished would be subject to social and logistical constraints.

Existing government services appear generally ineffective in the region; to improve the targeting and effectiveness of the programs, much additional investment would be required, together with major changes in program management. Increased political support for the programs would also be needed, but the poor of the region lack the political strength and capabilities necessary to lobby for changes. If the community were mobilized to address perceived nutritional problems, certain short-term

measures (outlined below) could be promoted. It should be emphasized, however, that such interventions, if not combined with the long-term strategies discussed earlier, may have only a minimal and brief effect on nutrition.

It was clear from the study that certain entrenched attitudes, and traditional beliefs and practices, negatively affect nutritional status; these may especially influence the diets of women and the growth of infants. Equally clear was the potential of the mass media to communicate messages for development and to modify attitudes. With even the poorest groups in the study area having access to radio and television, these media can offer a great deal in the way of nutrition education. Priority should be given to messages on the social and nutritional status of women, the vulnerability of infants to malnutrition and disease, and the importance of immunization and supplementary foods in ensuring a healthy future. Other social objectives that bear indirectly on nutrition and that could be communicated through the media include:

- Improving traditional agricultural practices and postharvest systems;
- Discouraging certain traditional, but harmful, practices;
- Further promoting certain traditional and useful practices;
- Improving personal and environmental hygiene;
- Providing information on credit facilities for agricultural and entrepreneurial activities; and
- Engendering confidence and self-motivation among community members.

The study also demonstrated the positive effects of social marketing. Use of the media for such activities should be expanded. Fostering awareness and the improvement of knowledge related to nutrition will facilitate practical follow-up and the creation of extension programs. Target populations will become more receptive to interventions. The design of appropriate messages will require creative aptitudes and approaches that transcend conventional nutrition education. The information contained in this report should assist communicators in initiating the development of such material. More detailed, anthropological research would also be beneficial.

Before contemplating specific health and nutrition interventions, the government medical services will need to regain the confidence of the communities. This can be achieved only by reorganizing and improving the local management of PHC, and by communicating new policies to the communities. Given the demands on women's time and labour, health services should be delivered to village households on a regular basis. For efficient functioning of the village health system, health workers must be recruited from the community: women health workers, known to other members of the community, would be particularly valuable in creating confidence and trust, and in communicating improved practices. The experiences of voluntary agencies operating in other regions (e.g., Jamkhed) would, in this respect, be extremely enlightening for the people of Parbhani (Faruquee and Johnson 1982).

Operational plan

Sustainable improvements in the nutritional status of the study population depend heavily on improvements in management and in rural development. To bring the recommended strategies into operation, institutions other than state or central government should become active in the region. There is much scope for the involvement of local voluntary organizations and for the participation of the communities themselves.

India has an estimated 12000 nongovernmental organizations (NGOs) working at the grass-roots level. Little has been documented, however, regarding the activities of these organizations, their present contributions, and their potential for improving the nutritional status of poor rural communities. NGO staff located within the community would be well placed to use the results of this RRA study and to continue to generate community participation. Greater mutual credibility would be created were NGO work to be integrated with national programs, policies, and services.

In the Parbhani region, fieldworkers could promote the formation of farmers' societies and women's groups. Farmers' societies would benefit both large and small farmers, and their families, by providing access to the following four areas.

- Advice on agricultural technologies — Group discussions or invited speakers could provide farmers with technical information, agricultural and postharvest technologies could, with input from the farmers, be specifically designed for local conditions; through discussion, farmers could express their problems and share their experience.
- Better seed grain — Seed grain purchased in bulk is invariably cheaper and of standard quality; the society would extend such services to poor farmers who at present find seed purchase uneconomical; central purchasing could also extend to fertilizers.
- Marketing services — Small farmers sell small quantities of produce in local markets and are unable to benefit from delayed sales; societies could store grain in bulk, provide improved marketing services and higher returns, and ensure security of food supplies.
- Legal advice and credit — With regard to labour issues, the societies would act in the interest of community members and would be able to provide credit at low interest rates.

Women's groups, known as *mahila mandals*, are becoming popular in urban areas and may play a key role in directly improving nutrition at the rural level. In the Parbhani region, the women's groups would provide:

- Training to facilitate local employment;
- Infant and child care, including supplementary feeding, for women in agricultural labour or other activities;
- Basic health services for women and children;
- Education in health, nutrition, and hygiene; and
- Nonformal adult education for women, teaching better income utilization, banking, credit, legal rights, and other issues.

Before implementing these strategies, more knowledge is required of NGO activities and capabilities, particularly in the Parbhani region or in similar agroclimatic zones. Assistance to NGOs in the use of RRA techniques for community assessment would, moreover, further the identification of causes and remedies for poor nutrition. Above all, attention should be given to integrating NGO work with wider, national programs and to cultivating mutual understanding and collaboration.

Future research needs

Many aspects of this study could be researched in more detail. Priority research, the results of which could have a direct bearing on nutrition planning, would include:

- Further applied anthropological research to generate a better understanding

both of traditional food taboos and fallacies and of certain apprehensions concerning health;

- More research on intrafamily food-distribution patterns and on household-food acquisition with respect to the vulnerability to malnutrition of certain age groups;
- Studies on the transition from food-crop production to cash-cropping, with respect to the nutritional status of small-farm families and the landless;
- Assessment of the influence on rural employment, and indirectly on nutrition, of agricultural mechanization that may result in loss of jobs for women; and
- A better definition in nutritional terms of the trade-off between increased purchasing power of women and the time they allocate to breastfeeding and child care; research in this area would facilitate the design of child-care services.

Use of RRA in nutrition programing

We believe that RRA constitutes a viable methodological framework for four main activities: generating interaction between nutrition researchers and the malnourished; identifying target groups; determining the interrelated causes of malnutrition; and recommending priorities for intervention. The elaborate collecting and analyzing of quantitative data does not necessarily provide superior, or even adequate, guidelines for nutrition programing. The application of anthropological techniques and focusing on the causes of nutritional problems, combined with collecting selected quantitative data, can quickly generate pertinent information to assist in nutrition planning. Such information cannot be obtained by means of standard, quantitative measures of nutritional status; such measures would indicate only levels of malnutrition. Unless a broad understanding of the rural situation is obtained, nutrition policies are unlikely to achieve intended results. The RRA should, therefore, play a key role in community nutrition planning.

An RRA is never the same in every circumstance, nor does it follow a predetermined pattern; its usefulness as a means of generating information lies in these facts. Certain general principles must, however, be kept in mind; often a sharing of experience contributes to a wider use of the methodology and helps to improve the techniques used. In the Khon Kaen University (KKU) group, for example, we see an RRA conducted by a multidisciplinary team of researchers (Sanjart 1987); from our experience, however, we see that an RRA can also be conducted by a "one-person team" with a multidisciplinary approach to the community. In this section, we identify the problems encountered when an RRA is conducted in the community by such a "one-person team."

Team selection

A complex array of factors affects rural development and the nutritional and health status of the population; no one discipline can be singled out as a research priority. In the developing countries, however, it would not be easy to bring together representatives from agricultural, medical, and sociological disciplines: scientists generally limit their understanding and activities to the disciplines of primary interest to them.

The importance of an RRA lies in the fact that a large body of information can be obtained at costs lower than those of a traditional survey, and in a shorter period.

Cost

In exploratory RRAs leading to problem identification, the multidisciplinary team could comprise up to 20 experts from health, nutrition, agriculture, forestry, social sciences, and others (Samart 1987). The cost of employing researchers who not only have a good knowledge of their own disciplines but also are willing to live in remote rural areas could be prohibitive. Also, transport costs and living expenses could constitute a major part of the research expenses.

Time

With large teams, finalizing time schedules can be a time-consuming task in itself. The larger the group, the greater will be the task of finalizing a suitable schedule, both for field dates and for preparing the final report. A one-person team, on the other hand, can begin its appraisal as soon as the decisions have been taken on research design, geographical focus, and time schedule. Larger teams can, moreover, intimidate rural people. Chambers (1983) indicates that, because a large team is more likely to be conservative and cautious, it can take longer to produce a report and recommendations. The KKU experience also indicates that arranging accommodation for a large number of researchers can be problematic.

Members

Selection of team members is a vital issue in RRAs conducted by multidisciplinary teams. Among the most important characteristics of the team members are:

- Willingness to live in adverse rural conditions;
- Willingness to work with researchers from various disciplines;
- Willingness to cooperate, even when the discussions are not in their primary area of interest;
- Ability to link various disciplines pertaining to the broad issue of concern;
- Ability to communicate and collate discussion comments and draw conclusions from them;
- Willingness to reach a common understanding of research methodology and procedures;
- Understanding of the importance of qualitative, iterative research in rural development and policy planning; and
- Willingness to combine an anthropological approach with the prolonged training and experience gained in the exact sciences.

Let us imagine a situation in which a rural appraisal is in progress, involving a multidisciplinary team. The following question arises: What would a medical member of the team do if, in the middle of a dialogue with rural inhabitants, agricultural problems arise? Would he/she respond by saying, "I do not understand what problems you are talking about," or "Ask the agriculturist on the team," or "Come to me later, I need to discuss it with the agriculturist." The community would find reassurance in dealing with one or perhaps two team members in whom they could develop trust, and who could assist them in more than one area. Holtzman (1986), in his rapid appraisal guidelines for agricultural marketing and food system research in developing countries, indicates that multidisciplinary teams may not always be necessary.

It must be said, however, that the one-person team has certain limitations. Although such a team should have a working knowledge of more than one discipline and an in-depth knowledge in the field of primary interest, there is an obvious risk that

the discipline of greater expertise may dominate the others. For the one-person team to conduct a successful RRA, time must be spent before the field visits in discussion with experts from various fields and in literature searches on various issues and policies that affect human development in the region of study.

For an adoption of the multidisciplinary approach, it is, moreover, essential that the team develop a basic framework of topics that can function as a guideline for discussion and data collection. (Figure 1 was developed as an outline for data collection.) Extensive preliminary research must accompany the setting up of the guidelines. Such research would relate to health, nutrition, agriculture, social structure, local culture, and traditions; efforts must be made to contact experts on the various subjects, both within the region and outside it. Even before the field visits begin, the researcher, therefore, faces an exhausting schedule: the various experts, who live in different regions, will have to be met in the shortest time feasible, and all information pertaining to the region be assimilated.

Conducting a rural appraisal is tedious also in terms of the living conditions of the researchers. If the "unreached" — the poorest, living in remote corners of villages — are to be reached, a high level of commitment is required, particularly if the researcher is acting alone. Such work may involve days or weeks of isolation in extremely unsatisfactory environments.

It is essential, moreover, to include women researchers in rural appraisal teams, especially for RRAs conducted in the nutrition and health context. In the developing nations, particularly in India and the Islamic nations, women (especially rural women) are not permitted to interact with men other than their own husbands (and that only in the privacy of their own dwelling) or sons; a woman researcher is, therefore, necessary to deal with women's issues. Women have in the past been considered shy interviewees; in the present study, however, the women talked without inhibition, even revealing personal problems. This finding is supported by various researchers: Palmer (1981) also observed that women are generally more forthcoming with information than are men. In her experience, the female researchers were able to establish a rapport with the village women much faster than could male researchers.

It may, however, be difficult for a woman to live in the isolated and sometimes hostile environments in which the research is to be carried out. We are not aware of many women in India who would be willing to venture out, or who would be permitted by their families to do so.

Emphasis on qualitative survey

The appraisal did not involve the measurement of any nutritional status index, e.g., height, weight, mid-arm circumference, head circumference (for infants), body-fat measurements, food intakes, or biochemical indicators. No survey to quantify the level or grade of malnutrition was conducted. No medical team was involved to identify the prevalence of deficiency signs, respiratory or gastrointestinal tract infections, or related diseases. No attempts were made to quantify the amount of grains produced, stored, sold, or lost during storage, and no time–energy management study was conducted. Data were obtained through observations and semistructured interviews, and secondary data were obtained on agricultural patterns, health status, government programs, and regional policies for the study region.

The quantitative information was gathered from every second family in the study. Factual information was obtained on the following: family size; type; education (of at

least one family member); occupation (landholder, labourer, or both); economic status (based on size of landholding); and types of crops sown by landholders in the two major cropping seasons. The research also compared the attitudes of the landholders and the landless with regard to infant-feeding practices and religion.

The survey was primarily qualitative in character, involving free and open discussions between the researcher and the participating community. These discussions dealt with various issues related to agriculture, food, nutrition, health and disease, education, society, culture, postharvest processing, food marketing, availability of resources and technical assistance, and labour. To overcome the "dry-season bias" (Schofield 1974; Chambers 1982), efforts were made to cover the different seasons and agroclimatic conditions. Many families were visited more than once, sometimes at home around mealtimes or when the women were performing their household chores, or in the fields where the agricultural activities were in progress, or in the market place wherever there was the opportunity for interaction or observation. Field notes were made of these observations, and photographs taken.

Most of the traveling was done either on foot or in bullock carts, along with the surveyed community. Discussions were also held in local buses, when farmers and their families went to the local market or the weekly bazaar. The research was, therefore, conducted in a very informal atmosphere, enabling those interviewed to be more relaxed and not feel as though they were being examined. Such a mode of information-gathering enabled acceptance of the researcher "as part of the community" and provided greater research mobility, creating a "mobile laboratory."

Selection of respondents

Selection of respondents for the interviews and group discussions was made with great care.

The first people to be interviewed were the "key informants" of the village, i.e., the *sarpanch*, the school headmaster (if there was a school in the village), local health workers, and any self-styled local leader. To gain entry to the villages, it was necessary to inform these individuals as to the purpose of the research: people who intrude on the villagers' privacy are not welcomed. Once convinced that no harm is intended and that the outcome of the visit could be beneficial to them, they extend all help possible and are extremely cordial. Of course, one must be a little cautious of the extent of hospitality accepted: if the researcher spends a great deal of time with the rich and influential, he or she can become labeled as "their person"; it may then be difficult to obtain frank responses from the poor, who are often exploited by this group.

Once the researcher had been accepted by the influential people of the village, the actual process of respondent selection was begun. Because problems of undernutrition are related primarily to low socioeconomic status (often that of women and children), efforts were made to reach out to these groups. Although no systematic sampling procedure was followed to select respondents, care was taken to have these low-status groups well represented. Respondent households were selected according to such factors as size of landholding, type of dwelling, location in the village, and caste.

The district collector helped to identify backward villages not less than 35 km from district headquarters. The rural appraisal, therefore, represents much more than "development tourism — the brief rural visit by the urban-based professional" (Chambers 1980; Moore 1981).

Selection of groups

Groups were not selected through any systematic sampling procedure, but rather according to the nature of each discussion. It was not at first considered necessary, for example, to include men in discussions related to breastfeeding and infant-feeding practices. It became apparent, however, that these men played a role in the women's decision to breastfeed and in the continuance of breastfeeding. Surprisingly, it was the men who sometimes suggested types of supplementary infant food. In the course of the study, we came to understand this phenomenon: the men venture out of the villages into nearby urban centres much more than do the women and are, therefore, more exposed to the urban ways of life; most of the money in the family is, moreover, handled by the men, and with it the decisions regarding purchasing.

Groups of farmers participated in discussions on farming practices, and care was taken to make these groups as homogeneous as possible. No individual was allowed to dominate the discussion; all participants were given a chance to become involved.

Group discussions and interviews were especially useful in eliciting information from women on cultural beliefs and rituals, and on food fads and taboos related to pregnancy, lactation, and infant feeding.

Approaches to interaction

Certain basic principles, both for personal interviews and for group discussions, facilitate the establishing of rapport. These principles can be classified into verbal, nonverbal, and a combination of the two.

Verbal

- Learn to be a moderator, so that all group members may have a fair share of time in which to express their views.
- Learn to begin a conversation on a very general note, such as "Hello, how are you?"
- Never ask predetermined questions; these may at times seem out of context. Rather, pick up questions from the ongoing discussion; without, however, allowing the discussion to drift too far away from the key issue.
- Use locally understood concepts and terminology.
- The rural people are extremely inquisitive about the caste, life styles, incomes, and family histories of their urban appraiser. It is essential that he or she learn to be cautious in replying to such queries.

Nonverbal

- Dress in a manner that blends with the local culture: a woman, for example, visiting an Indian village in trousers would attract amusement.
- The researcher must literally get down to the level of the community: he or she must learn to squat on the floor along with the people, and not ask for a chair. (Often, as in smoke-filled households where cooking is taking place, it may be essential to sit on the floor.)
- Encourage people to think and to analyze themselves.

Combination

- A show of disapproval or criticism will only result in concealment of true responses during the interviews or discussions.

- A show of disapproval or criticism will only result in concealment of true responses during the interviews or discussions.
- It may sometimes be useful to spend a little time listening to the woes of the families.

Problems of self-assessment

The experience gained in this appraisal indicates a reluctance of the people, especially the underprivileged, to engage in self-analysis. Over the last few decades, they have learned to compromise and to accept their condition. Because no program or policy has benefited them in the long run, they now seem to expect nothing. Given a chance, however, to discuss their problems, to analyze their situation, to make suggestions for improvement, and to identify their priorities, they do so remarkably well.

What is identified as a problem by researchers may not be considered a problem by the rural community. For example, the rural women do not consider it necessary to begin supplementary feeding before the infant is 6 months old and often not before the age of 1 year; counter-suggestions must, therefore, be made tactfully. To a group of researchers advocating early supplementary feeding of infants, mothers responded saying, "It is unfortunate that urban mothers have to do that, because they cannot breastfeed their infants long enough." By "long enough," some mothers meant up to 7 years. As was successfully demonstrated by Manoff (1984) in Indonesia, low-cost nutrition education should, therefore, use the social marketing strategy of "feed forward" (listening to and learning from the people in advance, so that the program design might benefit from their input), rather than that of "feed back" (obtaining views on a program after its completion).

It may be unethical to raise the expectations of the participating group while no plans for further action exist. In the absence of external interventions, this will result only in a waste of time — the most precious resource of the poor. The advantage of an RRA exists only if rapid follow-ups take place and recommendations are enforced.

Duration of RRA

RRA is a process of learning about rural conditions in an intensive, iterative, and expeditious manner, with emphasis on tapping the knowledge of local inhabitants and combining it with modern scientific expertise. RRA is characterized by accelerated learning and not just overall speed. The intention is to achieve increased accuracy in situational analysis at low cost in terms of time and money.

The major advantage of RRA is its ability to generate, in a short time, information that can then be used by development planners. Although there have been difficulties in specifying a minimum and maximum time period for rapid appraisals, there is at least a general concensus on a minimum time. Key to a good rapid appraisal is allowing enough time to be observant, sensitive, and eclectic, and to follow up leads methodically (Carruthers and Chambers 1981). Anything less than 4 days would be insufficient for carrying out discussions, for identifying, discussing, and modifying ideas, and for putting these ideas together in a usable form (Chambers 1983). What distinguishes RRA from other exploratory interdisciplinary approaches that focus on a local level is the emphasis on speed of learning.

The duration of an RRA includes both the time spent in the field and that spent in analyzing data and preparing reports. The number of days spent in the field relates to

the type of RRA, the number of subtopics, and the location and number of villages involved in the study. Flexibility in the technique allows adjustment for specific objectives and for variations in local conditions and available resources. The flexibility inherent in rapid appraisal must extend to the definition of the term "rapid." Experience in the technique provides guidance for future decisions on duration, and may show whether there is an explicit need to identify minimum or maximum time limits for RRA. To benefit from flexibility, evaluation and careful judgment should be used to make effective and appropriate decisions, without sacrificing quality of information.

Issue of recognition

To gain recognition, researchers in scientific disciplines are expected to undertake highly technical work. RRA, at present, affords only minimum recognition and remuneration. Because the field is scarcely recognized in cultural, health, and nutritional institutions, it has not yet been established within an institutional framework. Khon Kaen University in Thailand has undertaken the task of providing training and experience in the rapid appraisal methodology. KKU, however, uses only the "multidisciplinary" team approach for rural and farming-systems research projects.

Whatever the approach, thought must be given to the means whereby recognition may be generated for qualitative approaches, and RRA provided with academic respectability. Special awards could be given by various donor agencies in recognition of RRA research in national institutions. To further encourage the adoption of this methodology for development planning, small-grant schemes could be initiated, and a network of interested researchers from different institutions and various disciplines established. As experience in the methodology increases, knowledge could be exchanged through seminars and workshops. Appropriate programs must be developed to provide training in the methodological aspects of RRA. Clearly, the RRA technique can be very useful to those actively involved in development activities within the community, such as voluntary organizations.

The potential of RRA as a methodological tool for identifying community nutrition problems and determining actions for improvement is considerable.

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Appendix I: Guidelines for rapid rural appraisal

STATE _____ DISTRICT _____
TALUKA _____ VILLAGE _____
HOUSE NO. (if any) _____

GENERAL INFORMATION

1 Head of the household (name) _____
2 Type of family (nuclear/extended) _____
3 Family members, in order of seniority

Name	Age	Sex	Marital status	Education	Occupation

4 Socioeconomic status
(high/middle/low/tenant/landless labour/landlord)
_____
_____

5 Caste _____
6 Religion _____

AGRICULTURE

1 How much land do you own? _____
2 (a) What is the agricultural production system?
(subsistence farming/cash crop farming/both)
_____
_____

(b) Size of farm (area) for
subsistence farming _____
cash crop farming _____
both _____
(c) Rainfed _____
(d) Irrigated _____

3 What are the kharif/rabi/summer crops grown?

Kharif	Rabi	Summer
Jowar, bajra, maize, paddy, mung, tur, soybean, groundnut	Jowar, wheat, maize, gram, pea, lentil, sunflower, safflower	Fodder, bajra, mung, jowar, groundnut vegetables, sugar cane maize
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

4 What is the annual production of each crop?
Kharif _____
Rabi _____
Summer _____

5 (a) Do you use any high-yielding varieties/hybrids? yes/no
(b) If yes, what are they? _____
_____
_____

6 Reasons for use of high-yielding varieties (yield high/resistant to diseases/store longer/ any other) _____

7 Staple food of farmers (one only) jowar/bajra/wheat/paddy _____

8 What are the agricultural implements used by the farmers?
(a) Wooden _____
(b) Iron _____
(c) Others _____

9 Which agricultural implements do you own?
_____
_____

10 What are the agricultural operations carried out by the family members?
(a) Men: Land preparation, sowing, cutting, fertilizer application, spraying and dusting, threshing, irrigating, harvesting
(b) Women: Land cleaning, sowing, weeding, fertilizer application, spraying, harvesting, scraping

11 Do you have livestock? yes/no
If yes, what are they?
(i) Cow (ii) Buffalo (iii) Cow and buffalo (iv) Sheep/goat (v) Bullock pair (vi) Poultry
_____

12 What is your source for seeds? _____
(a) Home/local market/certified seeds
(b) Do you know the agency from which the seeds are purchased? (seed corporation/agricultural univer sity/seed companies)

13 Do you consider consumer acceptability while growing the crop? yes/no

14 Do you consider market value while growing the crop? yes/no

15 What is your source of irrigation? Well/tubewell/ tank/canal/river _____

16 Is your produce for home consumption, or sale, or both?
Food crops _____
Cash crops _____

17 What are the diseases or pests you find in your crops?

Crop	Disease/pest
_____	_____
_____	_____
_____	_____
_____	_____

18 What control measures do you take?

Crop	Control measures
_____	_____
_____	_____
_____	_____
_____	_____

STORAGE

1 Do you store grains? Yes/no

2 Do you store grains for seed purposes? Yes/no

3 What storage methods do you use?
Inside the dwelling/outside the dwelling/in silos/ in pots/in pits/others _____

4 What problems do you commonly find with storage?
_____
_____

5 Do you use any pest control system? Yes/no

6 How long do you store your grain?
Cereals _____ Pulses _____

7 Percentage of grains lost per year in storage

Grain	Quantity spoilt
_____	_____
_____	_____
_____	_____
_____	_____

8 Is this stored grain only for your family or is it also for sale? _____

_____

9 Does your village have any facilities for food storage for the community? Yes/no _____

_____

10 Do you store the whole gram as such or in the form of dal? Why? _____

_____

11 What is the average quantity stored?

_____

PROCESSING

1 Do you apply home-level processing? Yes/no
What method do you use? With what frequency do you use primary processing? _____

_____

_____

2 Do you pretreat the legumes or food grains/millets before processing? Why? _____

_____

3 What do you do with the byproducts obtained?

_____

_____

4 Do you find that the time required for processing alters with pretreatment? Yes/no _____

_____

MARKETING

1 Pattern of selling
(a) in nearby town
(b) within the village
(c) to an assembler

2 Period of marketing
(a) immediately after harvest
(b) when prices are high
(c) when in need of money

3 Frequency of purchase of sorghum and millets

Item	Daily	Weekly	2-Weekly	Monthly	Quarterly	Yearly

FOOD HABITS

1 What are the foods obtained from your own farm?

_____

2 Who goes to buy food from the market? _____

3 What is purchased from the market and how often?

_____

4 Who provides money for food? _____

5 Who fetches fuel for cooking? _____

6 Who fetches water for cooking? _____

7 Type of water supply (piped water in the house/piped water outside the house/river/well)_____
Distance from the house _____

8 Is sufficient water available throughout the year? Yes/no

9 Type of cooking stove used (electric/gas/kerosene/smokeless chulla/ordinary chulla/charcoal pot) _____

10 Type of cooking vessels available (pot/bowl/frying pan/cooking pan/others) _____
Of what are they constructed (iron/steel/aluminum/clay/others _____

11 Cooking fuel used (electricity/gas/kerosene/coal/wood/charcoal/dried cow dung) _____

12 Who does the cooking? _____

13 Who assists in cooking? (daughter/neighbour/sister-in-law/others) _____

14 Where is the food prepared? (inside the dwelling/outside/both) _____

15 What prepreparation is done and for which foods?

_____

_____

_____

16 How much time is spent on it and who does it?

_____

_____

_____

17 How are the different kinds of foods prepared? Boiling/parboiling/steaming/baking/frying/roasting/fermenting/drying/others _____

_____

FOOD DISTRIBUTION AT HOUSEHOLD LEVEL

1 How many meals per day are prepared, and at what time? _____

2 Who is responsible for food distribution in the family? _____

FEEDING OF INFANTS (UP TO 3 YEARS OF AGE)

(All questions preferably to mothers with infants)

1 When is breastfeeding initiated? How many hours after birth? _____

2 How long is breastfeeding continued? _____

3 Is breastfeeding given on demand of the child or on a schedule? _____

4 At what age is the first food other than breast milk given (weaning)? _____

5 What was the first food given and how? _____

6 Are any infant foods purchased? If yes, on whose advice? _____

Which food? _____

How was it prepared? _____

7 Do your current responsibilities allow you enough time for breastfeeding? _____

If no, how do you manage? _____

8 Are any promotional activities for infant foods on-going in the community? _____

If yes, by whom? _____

9 Why did you stop breastfeeding? _____

10 Was it abrupt or gradual? _____

11 What kind of special (weaning) foods for infants are prepared or purchased? At what price? _____

FOOD AVOIDANCES

1 What foods are avoided during pregnancy? Why? _____

2 What foods are avoided during lactation? Why? _____

SPECIAL FOODS

1 Are special foods consumed during pregnancy? Why? _____

2 Are special foods consumed during lactation? Why? _____

FOOD SHORTAGE

1 What foods are consumed during food shortages?

_____

_____

2 Are food shortages or famines frequent? Yes/no

NUTRITION

Special care (Pregnant and nursing mothers)

1 Is there even distribution among the family members? What is the order of food distribution?

_____

_____

2 Are there any nutrition/feeding programs in your village? Yes/no

3 If yes, for whom? _____

4 What is the food distributed? _____

5 Do you like the food supplement? _____

6 Do you collect the food supplement regularly (if in the beneficiary category)? _____

Why? _____

7 Does anyone else from your family also consume it?

Why? _____

HEALTH

1 Do you consult "traditional" medical practitioners?

_____

2 Which is the nearest health facility from your village? _____

Distance from the village _____

3 Do you use the services? If not, why? _____

_____

4 When do you use these services? Soon after falling ill? After it has become serious? _____

_____

5 How frequently does anyone from your family fall ill? Who falls ill most often? What do they contract? _____

_____

_____

ADDITIONAL NOTES AND COMMENTS OF THE INTERVIEWER

_____

_____

_____

_____

_____

Appendix II: Classification of malnutrition

Gomez's classification — Based on height, weight, and weight/height as percentage of standard for age

Normal	>90% of standard
Mild malnutrition (Grade I)	75–90% of standard
Moderate malnutrition (Grade II)	60–75% of standard
Severe malnutrition (Grade III)	<60% of standard

Waterlow's classification — Based on height-for-age and weight-for-height

Normal	>95% of standard
Mild malnutrition (Grade I)	90–95% of standard
Moderate malnutrition (Grade II)	85–90% of standard
Severe malnutrition (Grade III)	<85% of standard

The authors

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Richard Young holds a doctorate in applied biochemistry and nutrition from the University of Nottingham, UK, and is a Fellow of the Institute of Food Science and Technology of the United Kingdom. He has 15 years experience in development research and administration, mainly in Asia and Latin America, and has published over 50 scientific papers and reports on food and nutrition topics. As an officer of the UK Overseas Development Administration, he directed university training schemes and research programs in food and nutrition in Mexico and Costa Rica. He also acted as a consultant for the Food and Agriculture Organization of the United Nations in the Latin American region. Based at the South Asia Regional Office of IDRC in New Delhi, India, between 1983 and 1988, he was responsible for IDRC's Postproduction Systems Program in that region. He is now coordinator of IDRC's Nutrition Unit.

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